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THE REGISTRAR-GENERAL'S

STATISTICAL REVIEW

OF

ENGLAND AND WALES

FOR THE YEAR

1933

(New Annual Series, No. 13)

TEXT

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Note.—Of the tables referred to below, those numbered in Arabic will be found in "Tables, Part I—Medical," and those lettered in "Tables, Part II — Civil," while those numbered in Roman numerals appear in the text of this volume.

DEATHS.

The deaths of 496,465 persons were registered in England and Wales during 1933, 250,625 of these being males and 245,840 females.

This number is 2·5 per cent. above that for 1932.

Deaths of non-civilians, which numbered only 377, are now allocated to their administrative area of residence, and are included in all 1933 tables.

Death-Rate.—The 496,465 deaths correspond to a rate of 12·3 per 1,000 of the estimated population. When standardized* to correct for the deviation of the sex and age distribution of the population, as shown in Table XIX, from that of the standard population of 1901, this death-rate is reduced to 9·8.

As the population of this country in 1901 included relatively few infants and old people it forms a standard exceptionally favourable to low mortality. Its use for this purpose accordingly yields comparatively low standardized rates all round. In order to correct any wrong impression which might arise from this fact, and to provide standardized rates for this country comparable with those of countries using the standard recommended by the International Statistical Institute (a composite population made up of those of a large number of European countries in 1900 or 1901), rates calculated upon the latter by the method suggested by the Institute† are shown in Table XIX, as well as those based on the 1901 English standard, which is that always used elsewhere in this Review. It will be seen that use of the less favourable standard increased the rate from 9·8 to 11·0 per thousand.

The rate of 9·8 per 1,000 is seen from Table 3 (Part I) to be only 0·2 above that for 1930 which is the lowest recorded, and is below the standardized rate of 10·3 for the quinquennium 1926–30.

When compared with 1932 the rates were higher at every age shown in Table XIX, except for children under 5 and males aged 65–75 and over 85 years. For most causes of death the stand-

* The term "standardized death-rate" means the death-rate corrected for differences of sex and age constitution of the population. For a full description of the methods employed for this "standardization" *see* The Registrar-General's Decennial Supplement—1921, Part III (pages xxxiii—xlii). Standardized death-rates for the sexes separately quoted in this Review are based upon the age distribution of persons of undistinguished sex in the general population of England and Wales in 1901.

† Annuaire International de Statistique, 1917, p. viii.

ardized rates in Table 8 were below the average for the preceding five years, the comparison on this basis being specially favourable for measles, whooping cough, diphtheria, encephalitis lethargica, respiratory diseases, tuberculosis, valvular disease of the heart, chronic nephritis and cirrhosis of the liver, and for general paralysis and hernia in males. The causes which showed appreciable increases over the preceding five-year average were influenza, scarlet fever, cerebro-spinal fever, acute poliomyelitis, erysipelas, carbuncle and boil, diseases of the nasal sinuses, ear and mastoid, malignant endocarditis, myocardial degeneration, angina pectoris, in both sexes, and diabetes, pernicious anæmia, leukæmia, appendicitis and peritonitis in females.

Mortality at different portions of the year.—Table 4 indicates that the crude death-rate was below the corresponding rate in the decade 1921–30 for the June and September quarters, but was higher than in the preceding three years in the March quarter and higher than in the preceding six years in the December quarter. Table 31 shows that both the second and third quarters were unusually warm when judged by the mean air temperature at Greenwich, the former being the warmest since 1893 and the latter since 1911.

The contributions of the four quarters to the year's mortality in quinquennial periods since 1851, and in 1931, 1932 and 1933, are shown in Table I. It should be noted, however, that the crude quarterly mortalities in Tables I and 4 do not represent the full improvement which would be registered since 1901 if these rates were standardized.

The March quarter of 1933 was characterised by an influenza epidemic similar in extent to that of 1927, that is to say, causing greater mortality assigned to that cause than in any year since 1919, with the single exception of 1929.

The percentage contribution of the March quarter to the year's mortality, which has shown a progressive increase since 1896–1900, was lower in 1933 than in the years 1927 and 1929, but it exceeded the average figure for any quinquennium in the table.

The present stability of the death-rate in the last three quarters of the year is more apparent from the experience during the last ten years (Table 4). The average mortality in these quarters during the decennium ranged only from 10·7 to 11·4, while the death-rate in the March quarter fluctuated between 13·4 in 1930, and 20·9 in 1929, an influenza year when the first quarter was exceptionally cold. So long as these tendencies continue, the mortality experienced in the March quarter virtually determines the death-rate for the year.

The numbers of deaths from different causes which occurred in each of the first nine months of the year are set out in Table 23.

Mortality of each sex.—The excess of male over female mortality in 1933 was 24 per cent., compared with 26 in 1931 and 25 in 1932. Comparing the sex rates age by age, male excess occurred at each

age group, this excess being greater, except at ages 25–45 and 65–75, than in either of the quinquennia 1921–5 or 1926–30. These changes recorded in Table II are derived from Table 5, with substitution for 1911–15 and 1916–20 of rates based on total male population and deaths registered in this country for those in Table 5, which refer to civilian males only.

Table I.—Quarterly Death-rates in each quinquennium 1851–1930 and in 1931, 1932 and 1933 with ratio to yearly rate taken as 100.

	Death-rate per 1,000 living.				Ratio to yearly rate taken as 100.			
	March.	June.	September.	December.	March.	June.	September.	December.
1851–55	25·3	22·5	21·0	21·9	111	99	93	96
1856–60	24·1	21·6	19·6	21·9	111	99	90	100
1861–65	25·7	22·0	20·4	22·3	114	97	90	99
1866–70	24·7	21·6	21·5	22·0	110	96	96	98
1871–75	24·3	21·1	20·4	22·1	110	96	93	100
1876–80	23·2	20·7	18·8	20·6	112	100	90	99
1881–85	21·4	19·3	17·6	19·4	110	99	91	100
1886–90	21·7	18·0	17·0	18·9	115	95	90	100
1891–95	21·8	18·5	16·4	18·1	117	99	88	97
1896–1900	19·5	16·6	17·5	17·2	110	94	99	97
1901–05	17·9	15·2	14·9	16·1	112	95	93	101
1906–10	17·4	14·1	12·6	14·7	118	96	86	100
1911–15	16·9	13·7	12·7	14·0	118	96	89	98
1916–20	17·5	13·5	10·9	15·8	122	94	76	110
1921–25	15·1	11·9	9·6	12·0	124	98	79	98
1926–30	15·9	11·5	9·4	11·6	131	95	78	96
1931	16·5	11·5	9·6	11·7	134	93	78	95
1932	15·4	11·6	9·7	11·5	128	97	81	96
1933	17·1	10·8	9·4	12·0	139	88	76	98

Table II shows that male excess is lowest at ages 10–15 for which age group a female excess was the rule until 1927. At 5–10 a small female excess during 1891–1910 has given place to a male excess of 10 per cent. or greater, and at 10–15 a similar reversal of the sex ratio has occurred since 1916–20. At 15–20 this took place at the end of last century. At 25–35, on the other hand, the male excess, after reaching a maximum in 1911–20, is declining.

In 1933 the maximum disparity in sex mortality is reached at ages 45–55, after which it decreases again with advancing age. Only in extreme old age has the female mortality not declined more than the male since the middle of last century.

The causes of death accounting for this large male excess may be gathered from Table 8, in which the mortality disadvantage of females arising from their greater age is neutralized by reference of the rates for both sexes to a common population basis.

The causes chiefly accounting for male excess, with the contribution of each to its total of 2,111 per million, are seen to be, in order of importance, accident (313), heart disease (280), pneumonia (260) tuberculosis (194), digestive diseases (177), and arterio-sclerosis (128). These causes jointly contribute 64 per cent. of the total male excess. The principal causes common to both sexes in Table 8, for which female standardized mortality exceeds that of males, are, in order of numerical importance, mitral or unspecified valvular disease, rheumatoid and osteo-arthritis, whooping cough, diabetes, non-malignant tumours, gall stones, other diseases of the liver and gall bladder (not cirrhosis) and pernicious anæmia.

Table II.—Mortality of Males per cent. of that of Females at Various Ages from 1841–45 onwards. (*See* **Table 5.**)

	All Ages Standardized.	0–	5–	10–	15–	20–	25–	35–	45–	55–	65–	75–	85– and upwards
1841–45	109	117	102	92	88	105	95	101	114	111	111	109	106
1846–50	108	116	103	95	91	104	94	99	113	112	111	109	107
1851–55	110	116	104	98	90	103	97	102	118	114	112	110	106
1856–60	109	115	99	96	90	102	96	103	118	115	111	108	107
1861–65	111	115	102	98	93	105	100	109	122	118	112	109	110
1866–70	113	115	107	100	94	106	105	113	124	120	115	109	111
1871–75	115	117	108	100	97	109	109	119	128	121	114	111	110
1876–80	116	118	107	97	96	108	109	119	129	122	114	112	111
1881–85	115	118	102	97	96	102	104	117	127	122	116	113	112
1886–90	116	119	100	97	98	106	107	117	129	122	117	112	114
1891–95	116	119	98	96	100	108	108	118	128	121	115	111	110
1896–00	118	118	98	96	106	120	116	122	129	124	117	113	109
1901–05	119	119	97	95	107	119	118	121	130	128	119	115	110
1906–10	120	119	97	95	107	121	118	121	129	128	121	115	113
1911–15	122	120	100	95	111	122	124	126	132	133	124	118	115
1916–20	124	121	100	92	114	122	124	131	135	137	132	121	111
1921–25	122	124	104	100	100	113	114	130	132	133	127	119	110
1926–30	124	125	110	105	106	108	112	134	140	136	130	121	107
1924 ..	122	122	109	94	100	110	111	130	134	132	127	119	109
1925 ..	123	124	104	100	104	106	115	131	135	135	129	121	108
1926 ..	123	124	109	100	104	107	112	133	135	134	129	123	111
1927 ..	123	125	109	107	104	110	112	135	137	134	129	120	108
1928 ..	125	126	109	113	108	103	112	130	138	136	130	123	110
1929 ..	122	122	113	100	108	110	111	139	143	134	126	117	103
1930 ..	127	128	110	104	109	112	111	133	144	139	133	121	103
1931 ..	126	128	115	100	108	114	106	129	140	135	132	121	111
1932 ..	125	125	116	108	114	114	110	123	135	137	134	123	110
1933 ..	124	126	110	107	113	114	109	124	141	137	129	122	110

Infant Mortality.

Of the 496,465 deaths registered during the year, 36,960, or 7·4 per cent., were those of infants under one year of age.

The rate of infant mortality resulting from these deaths is 64 per 1,000 live births; this rate is 1 per 1,000 below that of the previous year but 4 per 1,000 above the lowest rate recorded, that of 1930.

The rates in the four quarters of the year were 84, 53, 49 and 69 respectively, being lower in the first three quarters and higher in the December quarter than in 1932.

Table III traces the changes in the quarterly incidence of infantile mortality during the last 63 years, and shows, in conjunction with Table I, that until 1901–05, and again, but to a very slight degree, in

1911–15, while the coldest months of the year yielded the highest general death-rate, the hot summer months levied the highest toll on infant life.

Since the beginning of the present century, this experience has undergone a remarkable change. In all four quarters, the infant death-rate has fallen in each successive quinquennium, but with great inequality. Comparing 1933 with 1896–1900, the fall ranges from 41 per cent. in the March quarter, 53 in the December, and 57 in the June, to 77 per cent. in the September quarter. This precipitate decline, due in a large measure to the fall in the mortality from epidemic diarrhœa, has so reduced the mortality in the third quarter that it now yields the lowest quarterly rate, while the March quarter yields the highest.

Table III.—Average Rate of Infantile Mortality by Quarters in Quinquennia, 1871–1930, and in 1931, 1932, and 1933.

	Yearly Average.	Quarterly Averages.			
		March.	June.	September.	December.
1871–75	153	151	133	180	149
1876–80	145	147	128	161	143
1881–85	139	140	125	152	139
1886–90	145	146	125	163	147
1891–95	151	151	132	169	151
1896–1900	156	142	124	212	148
1901–05	138	137	113	162	140
1906–10	117	124	98	120	128
1911–15	110	119	91	120	109
1916–20	90	116	83	75	91
1921–25	76	94	70	62	77
1926–30	68	91	60	52	69
1931	66	94	59	46	67
1932	65	88	59	50	65
1933	64	84	53	49	69

The changes in the infant mortality rate from all causes and from diarrhœal diseases since 1861–65 are shown in Table IV. The diarrhœal rate for 1933 is above that of the three preceding years and of 1922 and 1927 (*see* Table 12) but below that of any other year, notwithstanding that the September quarter was the warmest since 1911 when judged by the mean air temperature at Greenwich. Further reference to this is made on p. 23.

Table V shows that the fall during the five quinquennia for which detailed age distinction is now available was continuous at every age-group except 1–7 days, at which age the rate in 1926–30 was slightly in excess of that for the preceding five years. During the first month of life the fall was 21 per cent., but at the later age-groups the average fall was slightly over 50 per cent., reaching a maximum of 56 per cent. at 3–6 months. At ages from 1 week upwards a further

fall was registered in 1933 on the 1926–30 rates ranging from 3 to 9 per cent. up to 6 months, to 16 at 6–9 months and 20 at 9–12 months.

Table IV.—Infant Mortality, distinguishing Mortality from Diarrhœal Diseases, 1861–1933.

Deaths under 1 year of age per 1,000 Live Births.

Year.	Diarrhœal Diseases.	Other Causes.	All Causes.	Year.	Diarrhœal Diseases.	Other Causes.	All Causes.
1861–65	15	136	151	1921	14	69	83
1866–70	20	137	157	1922	6	71	77
1871–75	19	134	153	1923	7	62	69
1876–80	16	129	145	1924	6	69	75
1881–85	14	125	139	1925	7	68	75
1886–90	17	128	145				
1891–95	20	131	151	1926	8	62	70
1896–00	31	125	156	1927	6	64	70
1901–05	23	115	138	1928	6	59	65
1906–10	18	99	117	1929	7	67	74
1911–15	19	91	110	1930	5	55	60
1916–20	9	81	90				
1921–25	8	68	76	1931	5	61	66
1926–30	6	62	68	1932	6	59	65
				1933	6	58	64

In the first week of life the recent tendency for the rate to increase was continued in 1933, and in seeking a cause for this the increasing proportion of primiparous births to all births should be borne in mind.

Distribution of Infant Mortality.—Table VI shows how infant mortality was distributed in 1933 between the sexes and throughout the country.

For convenience in the interpretation of this and similar tables where the regional subdivision is employed, the counties comprising each region are given below.*

The rates for the aggregates of different classes of area are, as usual, highest for the county boroughs and lowest for rural districts,

* *Regional Summary.*—The country was re-divided into regions in 1931, after consultation with other Government Departments, with a view to securing greater homogeneity in the character of the sectional populations than was provided by the old grouping into North, Midlands, South (including London) and Wales.

The counties in the various regions are as follow :—

South East.
Bedfordshire.
Berkshire.
Buckinghamshire.
Essex.
Hertfordshire.
Kent.
London.
Middlesex.
Oxfordshire.
Southampton.
Surrey.
Sussex, East.
,, West.
Wight, Isle of.

North I.
Durham.
Northumberland.

North II.
Cumberland.
Westmorland.
Yorkshire.
East Riding.
North Riding.

North III.
Yorkshire,
West Riding.
York C.B.

North IV.
Cheshire.
Lancashire.

Midland I.
Gloucestershire.
Herefordshire.
Shropshire.
Staffordshire.
Warwickshire.
Worcestershire.

Midland II.
Derbyshire.
Leicestershire.
Northamptonshire.
Nottinghamshire.
Peterborough,
Soke of.

East.
Cambridgeshire.
Ely, Isle of.
Huntingdonshire.
Lincolnshire—
Parts of Holland.
,, Kesteven.
,, Lindsey.
Norfolk.
Rutlandshire.
Suffolk, East.
,, West.

South West.
Cornwall.
Devonshire.
Dorsetshire.
Somersetshire.
Wiltshire.

Wales I.
Brecknockshire.
Carmarthenshire.
Glamorganshire.
Monmouthshire.

Wales II.
Anglesey.
Caernarvonshire.
Cardiganshire.
Denbighshire.
Flintshire.
Merionethshire.
Montgomeryshire.
Pembrokeshire.
Radnorshire.

For the constitution of Greater London, *see* pp. 63–65 of the Preliminary Report on the Census of England and Wales, 1931

London occupying an intermediate position together with the smaller towns. In London's outer ring, which comprises almost as great a population as London itself, infant mortality was lower than in the aggregate of all the rural districts outside Greater London, and was

Table V.—Age Distribution of Infant Mortality, 1881–1933.

Rates per 1,000 (Live) Births.

Year.	Days.		Weeks.				Months.					Total under one year.
	0–1	1–7	0–1	1–2	2–3	3–4	Total under four weeks	Four weeks to 3 m'nths	3–6	6–9	9–12	
1881–1885 ..	—	—	—	—	—	—	67		28	44		139
1886–1890 ..	—	—	—	—	—	—	69		30	46		145
1891–1895 ..	—	—	—	—	—	—	74		31	46		151
1896–1900 ..	—	—	—	—	—	—	74		34	48		156
1901–1905 ..	—	—	—	—	—	—	70		28	40		138
1906–1910 ..	11·5	13·0	24·5	5·8	5·7	4·2	40·2	22·8	22·0	17·3	14·8	117·1
1911–1915 ..	11·4	12·7	24·1	5·7	5·3	3·9	39·0	20·2	19·6	15·9	14·1	108·7
1916–1920 ..	11·0	12·4	23·4	5·6	4·7	3·4	37·0	16·5	14·6	12·0	10·8	90·9
1921–1925 ..	10·4	11·3	21·7	5·0	3·9	2·8	33·4	12·8	11·3	9·2	8·3	74·9
1926–1930 ..	10·3	11·5	21·8	4·3	3·2	2·4	31·8	10·9	9·6	8·1	7·5	67·9
1906 ..	11·8	13·2	25·0	6·1	6·2	4·6	41·9	25·7	27·0	20·7	17·2	132·5
1907 ..	11·3	13·1	24·4	6·0	5·9	4·5	40·7	23·3	21·3	17·3	15·1	117·6
1908 ..	11·5	12·8	24·3	5·9	5·8	4·3	40·3	24·2	23 6	17·7	14·6	120·4
1909 ..	11·6	13·2	24·7	5·7	5·3	4·0	39·8	20·4	19·2	15·6	13·8	108·7
1910 ..	11·5	12·5	24·1	5·4	5·1	3·8	38·5	20·0	18·8	15·0	13·2	105·4
1911 ..	11·6	12·7	24·3	6·0	6·0	4·5	40·6	24·7	25·9	20·6	17·4	129·2
1912 ..	11·3	12·9	24·2	5·6	5·0	3·7	38·4	17·7	14·9	12·5	11·4	94·7
1913 ..	11·8	12·7	24·5	5·8	5·4	3·9	39·5	20·3	19·8	15·7	13·6	108·9
1914 ..	11·4	12·7	24·1	5·5	5·0	3·9	38·5	19·3	18·7	15·0	13·0	104·4
1915 ..	10·9	12·5	23·4	5·7	5·0	3·7	37·7	18·6	18·2	16·0	15·2	105·8
1916 ..	10·9	12·3	23·2	5·6	4·9	3·4	36·9	16·9	15·2	11·7	10·3	91·1
1917 ..	11·0	12·4	23·4	5·6	4·8	3·4	37·1	16·9	15·0	11·6	10·6	91·1
1918 ..	11·1	12·1	23·2	5·5	4·6	3·4	36·6	17·1	16·1	14·4	13·7	97·9
1919 ..	12·2	13·7	25·9	6·1	4·9	3·6	40·4	16·4	14·4	11·8	10·3	93·2
1920 ..	10·4	11·5	21·9	5·3	4·6	3·3	35·0	15·5	13·0	11·0	10·0	84·5
1921 ..	10·8	11·6	22·4	5·4	4·5	3·0	35·2	14·7	13·7	9·7	7·8	81·2
1922 ..	10·4	11·6	22·0	5·2	4·1	2·8	33·9	12·4	10·6	9·2	8·6	74·7
1923 ..	10·2	10·9	21·1	4·6	3·6	2·6	31·9	11·4	10·0	8·3	7·6	69·2
1924 ..	10·6	11·2	21·8	4·8	3·8	2·6	33·0	12·4	10·8	9·3	8·8	74·2
1925 ..	10·1	11·1	21·2	4·7	3·7	2·7	32·3	12·5	11·2	9·4	9·0	74·5
1926 ..	10·0	11·3	21·3	4·6	3·6	2·5	31·9	11·6	10·4	8·6	7·7	70·2
1927 ..	10·6	11·6	22·2	4·3	3·4	2·5	32·3	10·7	9·7	8·7	8·2	69·7
1928 ..	10·4	11·2	21·6	4·1	3·0	2·4	31·1	10·7	9·2	7·4	6·8	65·1
1929 ..	10·4	11·9	22·3	4·6	3·3	2·6	32·8	11·6	10·7	9·9	9·4	74·4
1930 ..	10·4	11·6	22·0	3·8	2·9	2·2	30·9	9·6	7·8	6·1	5·5	60·0
1931 ..	10·4	11·7	22·1	4·0	3·1	2·4	31·6	10·9	9·3	7·8	6·8	66·4
1932 ..	10·6	11·8	22·4	3·8	3·0	2·4	31·6	10·8	9·1	7·2	6·3	65·0
1933 ..	11·1	11·8	22·9	4·0	3·1	2·2	32·2	9·9	8·8	6·8	6·0	63·7

Rates per 1,000 of those for 1906–10.

1906–1910 ..	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1911–1915 ..	991	977	984	983	930	929	970	886	891	919	953	928
1916–1920 ..	957	954	955	966	825	810	920	724	664	694	730	776
1921–1925 ..	904	869	886	862	684	667	831	561	514	532	561	640
1926–1930 ..	896	885	890	741	561	571	791	478	436	468	507	580
1926 ..	870	869	869	793	632	595	794	509	473	497	520	599
1927 ..	922	892	906	741	596	595	803	469	441	503	554	595
1928 ..	904	862	882	707	526	571	774	469	418	428	459	556
1929 ..	904	915	910	793	579	619	816	509	486	572	635	635
1930 ..	904	892	898	655	509	524	769	421	355	353	372	512
1931 ..	904	900	902	690	544	571	786	478	423	451	459	567
1932 ..	922	908	914	655	526	571	786	474	414	416	426	555
1933 ..	965	908	935	690	544	524	801	434	400	393	405	544

10·7 per 1,000 live births less than in the Administrative County. The only region showing a lower rate than this was the surrounding area of South-East England outside Greater London.

It has been noticed almost invariably since 1911 that the Northern county boroughs have had the highest and the rural districts of the South the lowest infant mortality rate, and it was pointed out in Table XXI of the Review for 1931 (Text, p. 27) that when the twelve regional aggregates in use prior to 1931, apart from London, were arranged in order of the mean number of persons per room in 1931, the rates for 1926–30 almost followed the same order.

Table VI.—Distribution of Infant Mortality, 1933.

	Deaths per 1,000 (Live) Births.			Mortality per cent. of that in England and Wales.		Deaths per 1,000 (Live) Births.			Mortality per cent. of that in England and Wales.
	Males.	Females.	Both Sexes.	Both Sexes.		Males.	Females.	Both Sexes.	Both Sexes.
England and Wales	71·8	55·2	63·7	100					
South-east ..	58·4	44·1	51·4	81	East	60·1	44·2	52·3	82
Greater London	61·3	46·7	54·2	85	South-west	56·8	41·9	49·5	78
Remainder of South-east ..	53·9	40·2	47·2	74	Wales	82·9	65·1	74·2	116
North	85·2	66·0	75·9	119	Wales I	87·5	67·8	77·9	122
North I ..	88·0	70·2	79·4	125	„ II	69·3	56·5	63·2	99
„ II ..	79·4	60·8	70·4	111	County Boroughs* ..	84·3	65·0	74·9	118
„ III ..	80·4	62·9	71·8	113	Other Urban Districts*	70·6	53·5	62·3	98
„ IV ..	88·1	67·2	77·9	122	Rural Districts* ..	62·9	49·4	56·3	88
Midland	73·1	57·0	65·2	102	Greater London { Admin. Co.	66·8	52·0	59·5	93
Midland I ..	72·9	58·3	65·7	103	Greater London { Outer Ring	55·9	41·3	48·8	77
„ II ..	73·5	54·5	64·2	101					

* Excluding Greater London.

In Table VII of the Review for 1932 it was further shown that when the county boroughs and county aggregates of urban and rural districts were grouped according to their mean densities per room, the infant mortality rates in 1930–32 increased regularly with the density. Thus whilst county boroughs with mean densities less than 0·7 persons per room had an average rate of 57·6 per 1,000 births, those with densities exceeding 1·15 per room had an average rate of 92·7. A similar progression was evident for the county aggregates, but for the Metropolitan boroughs the increase was only noticeable for those with mean densities exceeding 1·3 persons per room. It must be remembered, however, that the mean density per room tends to increase from South to North, as indicated in Table VII of this Review where the county boroughs have been grouped according to the zones of latitude in which they are situated and also according to the percentage of the populations in private families who were living more than two per room in 1931.

The rates progressively increase as the measure of overcrowding rises within each latitude zone. A low average density of occupation of houses as measured by the number of rooms and persons, with all that is implied by that in social well-being, is clearly conducive to a

Table VII.—Infant Mortality, 1933, in the County Boroughs grouped according to their Latitude and proportions of their populations living in overcrowded conditions in 1931. (1930-32 rates in parentheses).

Grouping by per cent. of population living at density of more than 2 per Room.	Degrees of North Latitude.						
	50°–	51°–	52°–	53°–	54°–	55°–	All.
Infant Mortality (all Causes) per 1,000 Live Births.							
0–	52·5	45·7	62·3	64·3	—	—	57·9 (57·1)
3–	52·3	59·4	70·0	71·6	—	—	63·9 (62·5)
6–	—	67·4	69·7	73·3	64·5	—	71·6 (72·3)
9–	57·9	—	86·2	94·0	73·8	—	89·5 (84·5)
12–	—	—	101·6	89·0	91·4	—	91·6 (85·1)
15 and over ..	—	64·5	—	115·5	82·0	86·3	81·7 (81·6)
All County Boroughs ..	53·5	60·7	70·3	81·2	81·7	86·3	73·9 (72·6)
Infant Mortality (Congenital Causes) per 1,000 Live Births.							
0–	35·3	26·7	30·9	35·2	—	—	31·5 (30·6)
3–	28·9	32·7	35·2	37·1	—	—	33·8 (31·9)
6–	—	31·1	35·3	35·2	34·6	—	34·9 (33·4)
9–	34·0	—	43·6	39·3	37·5	—	38·9 (34·6)
12–	—	—	37·9	45·9	41·4	—	43·4 (38·0)
15 and over ..	—	29·1	—	47·4	36·3	38·7	35·9 (33·1)
All County Boroughs ..	30·8	31·4	34·9	37·6	37·0	38·7	35·6 (33·2)
Infant Mortality (other Causes) per 1,000 Live Births.							
0–	17·2	19·0	31·4	29·1	—	—	26·4 (26·5)
3–	23·4	26·7	34·8	34·5	—	—	30·1 (30·6)
6–	—	36·3	34·4	38·1	29·9	—	36·7 (38·9)
9–	23·9	—	42·6	54·7	36·3	—	50·6 (49·9)
12–	—	—	53·7	43·1	50 0	—	48.2 (47·1)
15 and over ..	—	35·4	—	68·1	45·7	47·6	45·8 (48·5)
All County Boroughs ..	22·7	29·3	35·4	43·6	44·7	47·6	38·3 (39·4)
Mean No. of Persons per Room (Private Families).							
All County Boroughs ..	·78	·84	·80	·88	1·09	1·08	·86

low infant mortality rate, and vice versâ. At the same time this can account only in part for the northward increase, since in passing from the south coast zone to the industrial north (between 53° N and 55° N) the rates tend in general to rise within each group of towns whether characterised by a high or low percentage of overcrowding. It must be presumed therefore that northerliness is a factor of importance in its effect on infant mortality apart from housing density.

The lower part of Table VII shows that when mortality during the first year of life attributed to congenital causes (Nos. 157–161 of the International List) is separately analysed, the increase with overcrowding within each latitude zone was, in 1933, rather less evident than the increase from South to North in towns of similar overcrowding index. In 1930–32 (*see* Table VIII, 1932 Review) the former increase was scarcely evident at all. For mortality from causes other than congenital, however, the increase of mortality with overcrowding at a given latitude is very pronounced, as in 1930–32.

In the Review for 1932 (Table IX and p. 12) it was shown that the mean infant mortality rates of the 6 regions for 1931 and 1932 from causes described as premature birth and injury at birth followed the inverse order of the annual hours of sunshine recorded within those regions, and it was suggested that in so far as climate affects infant mortality at all, deficiency of effective solar radiation is probably a more important factor than the greater coldness of the northern towns.

Comparison of the rates in Table VII with the corresponding rates for the preceding triennium indicates that, whilst causes other than congenital showed no important differences, the 1933 mortality attributed to congenital causes was enhanced at all latitudes, and in every compartment of the table except two, the increase being greatest, however, in the towns with high indices of overcrowding, as may be seen by comparing the rates in the last column of the table with the corresponding rates for 1930–32, given in parentheses.

Table VI shows that in 1933 North I gave the highest rate of 79·4 per 1,000 births, this rate being 125 per cent. of the rate in England and Wales. North IV and Wales I followed with 122 per cent., North III with 113, and North II with 111. The Greater London rate was only 85 per cent. of that in England and Wales, that of the Eastern Counties 82, of the South-West 78, and of the South-Eastern region outside Greater London 74.

Compared with the preceding year Greater London, the South East, South West and North III showed substantially lower rates, whereas in Wales I mortality was considerably higher.

The extent of the fall in infant mortality in 1933 below the 1916–20 standard was 34 per cent. in London Administrative County, 28 per cent. in the North, 29 per cent. in the rest of England and 19 per cent. in Wales. Adhering to the density classification hitherto used, it is seen from Table VIII that the

Table VIII.—Infant Mortality at Various Stages of Infancy in different Classes of Area compared with that in 1911–15 and 1926–30.

	Under 4 Weeks.				4 Weeks to 3 Months.				3–6 Months.			
Mortality (per 1,000 Live Births) compared with 1911–15 taken as 1,000.												
	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.
1911–15	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1916–20	949	943	940	971	834	810	790	834	793	739	691	726
1921–25	800	855	862	871	574	640	627	672	605	604	550	577
1926–30	728	812	823	841	505	548	507	582	539	516	430	480
Mortality (per 1,000 Live Births) compared with 1926–30 taken as 1,000.												
	Greater London.	Outside Greater London.			Greater London.	Outside Greater London.			Greater London.	Outside Greater London.		
		County Boroughs.	Other Urban Districts.	Rural Districts.		County Boroughs.	Other Urban Districts.	Rural Districts.		County Boroughs.	Other Urban Districts.	Rural Districts.
1926–30	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1926	1,002	1,013	1,003	978	1,029	1,079	1,083	1,069	1,044	1,080	1,129	1,089
1927	993	1,018	1,032	1,005	889	976	1,025	1,070	931	1,004	1,087	1,050
1928	994	985	967	965	1,068	978	966	928	1,059	971	888	934
1929	1,041	1,020	1,027	1,060	1,091	1,041	1,070	1,088	1,094	1,117	1,134	1,115
1930	969	964	971	995	922	921	852	837	870	825	754	805
1931	1,017	981	989	1,010	1,075	993	1,003	937	1,037	980	946	910
1932	1,028	988	990	984	1,025	1,011	963	1,004	1,017	930	925	983
1933	1,041	1,007	1,003	1,016	869	938	906	927	891	956	905	854

	6–9 Months.				9–12 Months.				Total under 1 Year.			
Mortality (per 1,000 Live Births) compared with 1911–15 taken as 1,000.												
	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.
1911–15	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1916–20	735	729	685	739	738	732	701	736	833	818	800	851
1921–25	578	604	568	583	592	643	573	602	655	700	683	721
1926–30	546	517	463	506	529	550	478	535	592	626	598	659
Mortality (per 1,000 Live Births) compared with 1926–30 taken as 1,000.												
	Greater London.	Outside Greater London.			Greater London.	Outside Greater London.			Greater London.	Outside Greater London.		
		County Boroughs.	Other Urban Districts.	Rural Districts.		County Boroughs.	Other Urban Districts.	Rural Districts.		County Boroughs.	Other Urban Districts.	Rural Districts.
1926–30	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1926	950	1,096	1,087	1,073	1,004	1,038	1,037	1,000	1,007	1,047	1,045	1,017
1927	954	1,059	1,110	1,154	921	1,094	1,172	1,188	952	1,024	1,062	1,052
1928	1,040	883	880	851	1,039	885	836	874	1,028	956	933	936
1929	1,213	1,254	1,185	1,186	1,209	1,280	1,241	1,182	1,100	1,100	1,088	1,094
1930	849	707	736	729	830	703	714	756	913	871	872	900
1931	902	992	917	973	817	936	925	908	991	978	971	974
1932	915	897	824	925	937	791	795	910	1,000	947	938	974
1933	759	884	821	829	691	832	789	829	910	951	932	948

fall from 1911–15 to 1926–30 amounted to 41 per cent. in London, 37 per cent. in the county boroughs, 40 per cent. in the small towns and 34 per cent. in the rural districts. The 1933 rates showed a further improvement on 1926–30 rates amounting to 5 per cent. in the county boroughs, 7 per cent. in the small towns and 5 per cent. in the rural districts, Greater London being excluded in each case.

Distribution of the Fall in Mortality at Various Stages of Infancy.—The reduction of mortality at various stages of infancy in different classes of area is outlined for the period covered by this form of tabulation in Table VIII.

In this table the comparison with 1911–15 is shown up to 1926–30 on the basis of the division previously used, that is to say the aggregates referred to, other than the Administrative County of London, include in each instance some districts comprising London's outer ring, but from 1926–30 onwards the new density summary is used. It was pointed out in the Review for 1931 (p. 10) that the effect of the change on infant mortality rates is only of importance for the " other urban districts," the new aggregate having rates higher than the old, in 1931, by 5 per cent. for the first 4 weeks of life, 3 per cent. at 1–6 months, 8 per cent. at 6–9 months, 7 per cent. at 9–12

Table IX.—Infant Mortality (per 1,000 Live Births) at Various Stages of Infancy in Different Regions of England and Wales, per 1,000 of that in 1916–20.

	Under 4 Weeks.				4 Weeks to 3 Months.				3–6 Months.			
	England and Wales.	North.	Rest of* England.	Wales.	England and Wales	North.	Rest of* England	Wales.	England and Wales.	North.	Rest of* England.	Wales.
1911–15	1,053	1,032	1,074	1,051	1,232	1,194	1,262	1,310	1,370	1,322	1,425	1,540
1916–20	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1921–25	902	915	898	928	782	813	771	826	799	812	789	850
1926–30	859	871	855	952	660	687	650	699	665	673	657	695
1931	853	854	854	971	660	696	632	709	647	672	621	642
1932	853	853	858	953	660	704	633	644	634	642	620	624
1933	870	865	873	1,003	604	640	581	716	609	658	555	670

	6–9 Months.				9–12 Months.				Total under 1 Year.			
	England and Wales.	North.	Rest of* England.	Wales.	England and Wales.	North.	Rest of* England.	Wales.	England and Wales.	North.	Rest of* England.	Wales.
1911–15	1,392	—	—	—	1,380	—	—	—	1,218	1,187	1,242	1,273
1916–20	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1921–25	818	834	798	862	842	876	798	909	846	864	836	886
1926–30	698	691	700	719	721	737	716	710	755	764	755	808
1931	666	691	633	696	655	711	613	779	738	756	727	814
1932	619	596	635	600	602	581	613	596	723	723	729	759
1933 .. .	584	594	578	658	573	593	577	650	708	720	705	814

* Excluding London Administrative County.

months and 5 per cent. for the first year as a whole. This effect, however, is eliminated in Table VIII by the change of datum line at 1926–30.

In Greater London and each class of area 1933 rates show improvement over 1926–30 at each group of ages over 4 weeks. In the towns the degree of recent improvement progressively increases from 3 months onwards.

Table IX compares the extent of decline since 1916–20 at different stages of infancy in the North and in Wales with that in the rest of England, excluding London Administrative County. Mortality during the first 4 weeks has fallen to the same extent in the North as in the rest of England, by 13 per cent., but in Wales the improvement up to 1921–25, has not been maintained in more recent years.

In the second and third months the rates were lower in 1933 than in 1926–30 in the English divisions but not in Wales. At 3–12 months they were lower throughout, but the Welsh rates were considerably above the low levels attained in 1932.

The analysis of infant deaths by detail of age, initiated in 1905 with distinction of registration counties mainly urban and mainly rural in character, and expanded in 1917 and again in 1931, is given for each region and class of area in Table 13. Distinctions of sex and legitimacy are shown only for England and Wales as a whole, but are available for each of the populations dealt with. Some of the facts and rates applying to the illegitimate will be found in Table 14. The rates per 1,000 live births appear in Table X, and as percentages of the England and Wales rate in Table XI.

The chance of dying within half an hour of birth reached 2 per 1,000 in North II, Midland I and London, and was lowest in the East. This measure is very dependent upon accuracy of certification which in turn may be correlated with the frequency of the presence of a medical attendant at the birth. When the mortality within the first day as a whole is examined, Wales gives, as in each year since 1927, the highest rate of any of the large regions, the sequence being then as usual from North to South. For the combined mortality from the second to the seventh day Wales II shows the highest rate, 124 per cent. of the rate for England and Wales, closely followed by North I and Wales I, whilst London gives the lowest ratio, 74 per cent. North I gives the highest rates from the 3rd week to the 9th month, and North IV at 9–12 months. The South-West and South-East outside Greater London give the lowest rates after 3 months. The range of relative mortality increases from 86–119 per cent. of that of England and Wales for the first day's mortality, to 55–144 at 3–6 months, 59–141 at 6–9 months, and 57–142 at 9–12 months. In 1931 the regional range was greatest at 9–12, and in 1932 at 6–9 months.

Urban excess is not, as a rule, present from birth, but tends to increase throughout the later months of infancy. This is well shown in 1933 by contrasting London Administrative County with

Table X.—Infant Mortality at Various Ages, 1933.

Rates per 1,000 Live Births.

	Total under one Year.	Under 30 Minutes.	30 Minutes and under 1 Day.	Total under 1 Day.	Days. 1	2	3	4	5	6	1 Day and under 1 Week.	Weeks. 0	1	2	3	Total under 4 Weeks.	4 Weeks to 3 Months.	Months. 3–6	6–9	9–12
England and Wales.																				
All Infants .. M.	71·8	1·8	10·4	12·2	4·0	3·9	2·6	1·4	0·9	0·8	13·7	25·9	4·4	3·4	2·6	36·2	11·5	10·0	7·6	6·5
F.	55·2	1·7	8·2	9·9	3·1	2·5	1·6	1·1	0·9	0·7	9·9	19·8	3·6	2·7	1·9	28·0	8·3	7·5	5·9	5·5
P.	63·7	1·7	9·3	11·1	3·6	3·2	2·1	1·3	0·9	0·7	11·8	22·9	4·0	3·1	2·2	32·2	9·9	8·8	6·8	6·0
Legitimate .. M.	69·7	1·4	10·3	11·7	3·9	3·8	2·6	1·4	0·9	0·8	13·5	25·2	4·2	3·3	2·5	35·2	11·1	9·6	7·5	6·4
F.	53·2	1·3	7·9	9·3	3·1	2·5	1·6	1·1	0·8	0·6	9·7	19·0	3·5	2·6	1·9	26·9	7·9	7·3	5·8	5·3
P.	61·7	1·4	9·1	10·5	3·5	3·2	2·1	1·2	0·9	0·7	11·6	22·1	3·9	3·0	2·2	31·1	9·5	8·5	6·7	5·9
Illegitimate .. M.	117·7	9·4	14·1	23·5	5·4	5·2	3·3	2·3	1·2	1·0	18·4	41·9	7·2	5·7	5·1	59·9	21·0	19·2	10·0	7·6
F.	97·1	10·0	13·8	23·8	4·2	3·8	2·1	1·8	1·6	1·3	14·7	38·5	6·1	5·1	2·5	52·3	16·1	12·2	8·0	8·5
P	107·5	9·7	13·9	23·7	4·8	4·5	2·7	2·0	1·4	1·1	16·6	40·2	6·7	5·4	3·9	56·1	18·5	15·7	9·1	8·0
South-East	51·4	1·6	8·1	9·7	2·9	2·5	1·8	1·1	0·7	0·5	9·5	19·2	3·4	2·4	1·6	26·7	7·7	7·4	5·2	4·4
Greater London ..	54·2	1·8	8·0	9·8	2·8	2·5	1·6	1·0	0·7	0·4	9·0	18·8	3·5	2·4	1·6	26·2	8·4	8·7	6·1	4·8
Remainder of South-East	47·2	1 5	8·1	9·6	3·2	2·5	2·1	1·1	0·8	0·6	10·2	19·8	3·3	2·5	1·7	27·4	6·7	5·4	4·0	3.8
North	75·9	1·8	10·3	12·1	3·9	3·7	2·4	1·5	1·0	0·9	13·3	25·4	4·3	3·7	2·8	36·2	12·0	11·3	8·6	7·7
North I	79·4	1·9	10·5	12·5	3·6	4·3	2·7	1·6	1·1	1·0	14·4	26·8	4·4	3·9	3·1	38·3	11·0	12·7	9·6	7·7
,, II	70·4	2·2	9·5	11·6	3·8	2·9	2·3	1·6	0·8	0·7	12·1	23·8	4·3	3·9	2·0	34·0	12·0	9·5	8·3	6·7
,, III	71·8	1·7	9·3	11·0	4·0	3·7	2·5	1·7	0·8	0·9	13·7	24·8	4·2	3·7	2·4	35·0	11·4	10·9	7·7	6·8
,, IV	77·9	1·7	10·9	12·7	3·9	3·6	2·2	1·4	1·0	0·8	12·9	25·6	4·3	3·5	3·0	36·4	12·8	11·4	8·8	8·5
Midland	65·2	2·0	9·6	11·6	3·6	3·3	2·1	1·2	1·0	0·9	12·1	23·7	4·2	3·2	2·4	33·5	10·3	8·0	7·0	6·4
Midland I	65·7	2·1	10·2	12·3	3·9	3·0	2·0	1·3	0·9	0·9	12·1	24·4	4·1	3·1	2·4	34·0	10·4	8·1	7·1	6·1
,, II	64·2	1·9	8·4	10·3	3·1	3·9	2·2	1·0	1·0	0·8	12·1	22·3	4·4	3·5	2·3	32·4	10·1	7·8	6·8	7·0
East	52·3	0·8	8·6	9·5	3·9	3·0	2·5	1·2	1·1	0·7	12·3	21·8	4·1	2·7	1·6	30·1	7·3	5·6	4·9	4·3
South-West	49·5	1·8	7·9	9·8	3·5	3·6	2·4	1·3	0·8	0·8	12·3	22·0	3·5	2·3	1·9	29·7	7·4	4·8	4·1	3·4
Wales	74·2	1·7	11·3	13·0	4·5	4·0	2·4	1·3	1·1	1·0	14·3	27·2	4·9	3·4	2·6	38·2	12·4	9·5	7·5	6·6
Wales I	77·9	1·7	11·5	13·2	4·7	4·0	2·3	1·4	0·9	0·9	14·2	27·4	5·5	3·5	2·9	39·3	12·9	10·0	8·3	7·3
,, II	63·2	1·7	10·6	12·3	3·9	4·0	2·8	1·1	1·7	1·0	14·6	26·9	3·1	3·2	1·8	34·9	10·8	8·0	5·0	4·5
County Boroughs* ..	74·9	1·8	9·9	11·7	4·0	3·2	2·2	1·4	0·9	0·9	12·6	24·3	4·2	3·4	2·6	34·6	12·0	11·4	8·8	8·0
Other Urban Districts* ..	62·3	1·8	9·8	11·6	3·6	3·4	2·4	1·3	0·9	0·7	12·3	23·8	4·1	3·2	2·3	33·4	9·4	7·7	6·2	5·5
Rural Districts*	56·3	1·6	9·0	10·6	3·6	3·7	2·3	1·2	1·0	0·8	12·7	23·3	4·0	3·0	2·1	32·3	8·7	6·0	4·9	4·4
Greater London Admin. County	59·5	2·0	8·4	10·5	2·8	2·0	1·6	1·1	0·7	0·5	8·7	19·2	2·8	2·2	1·4	25·7	9·4	11·2	7·4	5·9
Outer Ring ..	48·8	1·5	7·6	9·1	2·7	2·9	1·6	1·0	0·7	0·4	9·3	18·4	4·1	2·5	1·7	26·8	7·3	6·1	4·7	3·8

* Excluding Greater London.

Table XI.—Infant Mortality at various Ages, in different parts of the Country, per cent. of that of all Infants of the same Age in England and Wales, 1933.

	Total under one Year.	Under 30 Minutes.	30 Minutes and under 1 Day.	Total under 1 Day.	Days.						1 Day and under 1 Week.	Weeks.				Total under 4 Weeks.	4 Weeks to 3 Months.	Months.		
					1	2	3	4	5	6		0	1	2	3			3–6	6–9	9–12
England and Wales P.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
England and Wales M.	113	106	112	110	111	122	124	108	100	114	116	113	110	110	118	112	116	114	112	108
England and Wales F.	87	100	88	89	86	78	76	85	100	100	84	86	90	87	86	87	84	85	87	92
South-East	81	94	87	87	81	78	86	85	78	71	81	84	85	77	73	83	78	84	76	73
Greater London ..	85	106	86	88	78	78	76	77	78	57	76	82	88	77	73	81	85	99	90	80
Remainder of South-East	74	88	87	86	89	78	100	85	89	86	86	86	83	81	77	85	68	61	59	63
North	119	106	111	109	108	116	114	115	111	129	113	111	108	119	127	112	121	128	126	128
North I	125	112	113	113	100	134	129	123	122	143	122	117	110	126	141	119	111	144	141	128
„ II	111	129	102	105	106	91	110	123	89	100	103	104	108	126	91	106	121	108	122	112
„ III	113	100	100	99	111	116	119	131	89	129	116	108	105	119	109	109	115	124	113	113
„ IV	122	100	117	114	108	113	105	108	111	114	109	112	108	113	136	113	129	130	129	142
Midland	102	118	103	105	100	103	100	92	111	129	103	103	105	103	109	104	104	91	103	107
Midland I	103	124	110	111	108	94	95	100	100	129	103	107	103	100	109	106	105	92	104	102
„ II	101	112	90	93	86	122	105	77	111	114	103	97	110	113	105	101	102	89	100	117
East	82	47	92	86	108	94	119	92	122	100	104	95	103	87	73	93	74	64	72	72
South-West	78	106	85	88	97	113	114	100	89	114	104	96	88	74	86	92	75	55	60	57
Wales	116	100	122	117	125	125	114	100	122	143	121	119	123	110	118	119	125	108	110	110
Wales I	122	100	124	119	131	125	110	108	100	129	120	120	138	113	132	122	130	114	122	122
„ II	99	100	114	111	108	125	133	85	189	143	124	117	78	103	82	108	109	91	74	75
County Boroughs* ..	118	106	106	105	111	100	105	108	100	129	107	106	105	110	118	107	121	130	129	133
Other Urban Districts* ..	98	106	105	105	100	106	114	100	100	100	104	104	103	103	105	104	95	88	91	92
Rural Districts*	88	94	97	95	100	116	110	92	111	114	108	102	100	97	95	100	88	68	72	73
Greater London Admin. County	93	118	90	95	78	63	76	85	78	71	74	84	70	71	64	80	95	127	109	98
Greater London Outer Ring ..	77	88	82	82	75	91	76	77	78	57	79	80	103	81	77	83	74	69	69	63

* Excluding Greater London.

its outer ring of suburbs. At 1–7 days and in the 2nd, 3rd and 4th weeks the rate was actually higher in the outer ring, but at 4 weeks to 3 months the rate for the outer ring was only 78 per cent. of that for London itself, and at 3–12 months less than 65 per cent. Outside Greater London the rates during the first few weeks are only slightly affected by urbanization, but the divergence between the county boroughs and rural districts rapidly increases to 62 per cent. of the rate for England and Wales at 3–6 months, 57 per cent. at 6–9 months and 60 per cent. at 9–12 months.

Table XII.—Mortality of the first 30 Minutes of Life 1933.

International List Numbers.	Cause of Death.	All Infants.	Under 30 Minutes.					
			Legitimate.			Illegitimate.		
			Males.	Females.	Both Sexes.	Males.	Females.	Both Sexes.
		Deaths.						
86	Convulsions	—	—	—	—	—	—	—
157	Congenital malformations	78	23	48	71	3	4	7
158	Congenital debility	27	15	8	23	1	3	4
159	Premature birth	404	199	172	371	19	14	33
160	Injury at birth	165	78	70	148	7	10	17
161 (*a*)	Atelectasis	117	63	45	108	6	3	9
161 (*b* & c)	Other diseases peculiar to early infancy	9	2	5	7	—	2	2
194 : 1	Lack of care	141	15	13	28	55	58	113
182	Accidental suffocation	3	1	1	2	1	—	1
172–175	Homicide	19	—	—	—	9	10	19
	Other forms of violence	32	—	3	3	14	15	29
	Violence and lack of care	*195*	*16*	*17*	*33*	*79*	*83*	*162*
	Other Causes	18	3	1	4	7	7	14
	All Causes	1,013	399	366	765	122	126	248
		Mortality per Million Live Births.						
86	Convulsions	—	—	—	—	—	—	—
157	Congenital malformations	134	81	177	128	234	318	276
158	Congenital debility	47	53	30	41	78	239	157
159	Premature birth	696	701	634	668	1,480	1,114	1,299
160	Injury at birth	284	275	258	267	545	796	669
161 (*a*)	Atelectasis	202	222	166	195	467	239	354
161 (*b* & *c*)	Other diseases peculiar to early infancy	16	7	18	13	—	159	79
94 : 1	Lack of care	243	53	48	50	4,284	4,615	4,447
82	Accidental suffocation	5	4	4	4	78	—	39
172–175	Homicide	33	—	—	—	701	796	748
	Other forms of violence	55	—	11	5	1,090	1,193	1,141
	Violence and lack of care	*336*	*56*	*63*	*59*	*6,153*	*6,604*	*6,376*
	Other causes	31	11	4	7	545	557	551
	All Causes	1,745	1,405	1,350	1,378	9,502	10,025	9,761
		Percentage of Total under 24 Hours.						
86	Convulsions	—	—	—	—	—	—	—
157	Congenital malformations	20	13	24	19	33	50	41
158	Congenital debility	11	11	8	10	17	38	29
159	Premature birth	9	9	10	9	12	10	11
160	Injury at birth	30	26	33	29	41	43	43
161 (*a*)	Atelectasis	20	20	20	20	46	21	33
161 (*b* & *c*)	Other diseases peculiar to early infancy	24	11	31	21	—	67	50
194 : 1	Lack of care	88	79	87	82	87	92	90
182	Accidental suffocation	18	11	20	14	100	—	33
172–175	Homicide	86	—	—	—	82	100	90
	Other forms of violence	89	—	100	100	88	88	88
	Violence and lack of care	*83*	*57*	*71*	*63*	*87*	*90*	*89*
	Other causes	31	10	8	10	88	88	88
	All Causes	16	12	15	13	40	42	41

Comparison of Table X with 1932 reveals increases in the rates for the first month of life in each region except North II, III, decreases at the 2nd and 3rd months except in Midland I and Wales, decreases at 3–6 months except in North I, II, III and Wales I, and decreases at 6–9 months except in North I and II, South West and Wales I. At 9–12 months there were increases in North I, II, IV, Midland II, East and Wales I, but decreases elsewhere.

Deaths occurring immediately after birth.—The separate tabulation of deaths registered as occurring within 30 minutes of birth according to sex, cause and legitimacy, first published in the Review for 1928, is repeated for 1933 in Table XII.

The table shows that this very early mortality displays in 1933 the same startling differential incidence upon the illegitimate as in previous years, especially for those causes of death which imply, or are likely to mask, violence or neglect. For violence and lack of care as a whole a rate of 6,376 per million for illegitimate infants compares with one of 59 for the legitimate; 83 per cent. of all such deaths under 24 hours occurred within this first half hour, as against 16 per cent. for mortality generally, so that the risk represented by violence and lack of care is one applying especially to this first half-hour of life. The rate of mortality among legitimate infants from all causes in 1933 was 1,405 per million live born males and 1,350 for females, the corresponding rates in the preceding 5-year period being 1,419 and 1,224 respectively. Comparison with the preceding years reveals a progressive increase since 1929 in deaths of female infants during the first half-hour attributed to congenital malformations, but no corresponding rise for male infants. Thus in 1931–33, 131 legitimate female infants died from congenital malformations in the first half hour compared with 85 in the preceding triennium, the corresponding totals for males being 74 and 86. On the other hand, male deaths attributed to injury at birth have increased, whereas those of female infants have decreased. The rates per million live births in each triennium 1928–30 and 1931–33 from various causes are given below. They show that atelectasis has also increased for infants of both sexes as a stated cause of death.

Legitimate Infants.	Males.		Females.	
	1928–30.	1931–33.	1928–30.	1931–33.
Congenital malformations ..	90	83	93	154
Congenital debility	87	85	62	56
Premature birth	700	715	583	570
Injury at birth	262	297	235	211
Atelectasis	148	192	145	161
Other diseases of early infancy ..	7	8	3	11

Of the 162 deaths of illegitimate infants assigned to violence and lack of care 107 or 66 per cent. relate to abandoned infants of unknown parentage.

Causes of Infant Mortality.—The causes of infant mortality are set forth in Tables 11–15, which compare the records of 1933 with those of previous years, and show the incidence of mortality from each cause upon infants distinguished by sex, age, legitimacy, class of area, and section of the country. From these tables has been prepared the comparison in Table XIII between the mortality from the chief causes distinguished at various ages in 1933 and 1928–32, and from all causes in 1933 and 1932.

Table XIII.—Comparison of Infant Mortality Rates (per 100,000 Live Births) in 1933 with those of immediately preceding years.

	Under 4 Weeks.	4 Weeks to 3 Months.	3–6 Months.	6–9 Months.	9–12 Months.	Under 1 Year.	Under 4 Weeks.	4 Weeks to 3 Months	3–6 Months.	6–9 Months.	9–12 Months.	Under 1 Year.
	Increase or Decrease from Various Causes as compared with 1928–32.						Percentage Increase or Decrease as compared with 1928–32.					
Measles (7)	—	− 1	− 7	−15	− 35	− 57	—	−33	−78	−42	−49	−47
Whooping cough (9)	+ 2	−12	−12	−23	− 13	− 59	+40	−27	−23	−37	−20	−25
Influenza (11)	+ 3	+ 5	+ 4	+ 7	+ 7	+ 24	+50	+42	+27	+44	+47	+37
Tuberculosis, all forms (23–32)	—	− 2	− 5	− 5	− 6	− 18	—	−29	−19	−15	−18	−18
Convulsions (86)	−18	−13	− 7	− 3	− 6	− 45	−15	−30	−23	−14	−40	−19
Bronchitis and pneumonia (106–109)	−14	−36	−34	−56	− 43	−183	−11	−12	−10	−17	−15	−13
Diarrhœa and enteritis (119)	−10	+ 3	+12	+ 5	+ 4	+ 15	−17	+ 2	+ 6	+ 4	+ 6	+ 3
Developmental and wasting diseases (157-159, 161 *a*, *b*)	+103	− 3	+ 2	—	+ 2	+105	+ 4	− 1	+ 2	—	+10	+ 4
Congenital defects (malformations and atelectasis) (157, 161a)	*+52*	*+11*	*+ 7*	*+ 4*	*+ 4*	*+ 78*	*+11*	*+ 9*	*+14*	*+19*	*+33*	*+11*
Congenital debility and icterus (158, 161b)	*−23*	*− 9*	*− 6*	*− 2*	*− 2*	*− 42*	*− 9*	*−10*	*−13*	*−15*	*−29*	*−10*
Premature birth (159)	*+75*	*− 5*	*+ 1*	*− 1*	—	*+ 69*	*+ 5*	*− 3*	*+ 7*	*−50*	—	+ 4
Injury at birth (160)	+18	—	− 1	+ 1	+ 1	+ 19	+ 9	—	*	*	*	*+ 9*
Suffocation—in bed or not stated how (182 part)	− 6	− 4	—	+ 1	—	− 9	−27	−25	—	+33	—	−17
Other causes	−17	−13	—	+ 2	− 9	− 39	− 7	−10	—	+ 2	− 8	− 5
All Causes	+61	−78	−47	−86	− 97	−247	+ 2	− 7	− 5	−11	−14	− 4
	Increase or Decrease of Mortality in 1933 as compared with 1932.						Increase or Decrease of Mortality in 1933 per cent. of that in 1932,					
All Causes	+62	−91	−37	−40	− 30	−136	+ 2	− 8	− 4	− 6	− 5	− 2

Note.—The percentages in this Table being based on rates per 100,000 live births may differ on this account from those derivable from the rates in Table V.

* Numbers too small to provide significant comparison.

The decrease from the previous year is seen to have applied to each period of age subsequent to the first month, which showed a slight increase. The same is true when comparison is made with the average rates for the preceding five years. Mortality of infants from influenza, diarrhœa and congenital defects increased at each age period, however, the first being attributable to the severe epidemic in the first quarter of 1933, and the second to the hot summer. Deaths attributed to congenital defects and injury at birth per 1,000 live births have progressively increased since 1923, their rate in 1933 again being the highest recorded in Table 12.

Mortality from premature birth, which has since 1922 risen and fallen each year with the influenza rate, was higher than in any year since 1924. Arranging the 12 years 1922–33 in ascending order of their infant mortality from influenza, the following correspondence is found between the rates per 100,000 live births from these causes.

No. of years.	Influenza.	Premature Birth.
5	20 to 58	1749 to 1768
2	69, 81	1820, 1830
5	89 to 125	1855 to 1882

Notwithstanding the influenza epidemic, bronchitis mortality was the lowest recorded, and pneumonia the lowest except in 1921, 1923 and 1930. The measles rate was the lowest recorded except in 1921, and for whooping cough it was the lowest except in 1930 and 1919. Record low levels were also reached for tuberculosis of the nervous system, syphilis, convulsions, respiratory diseases other than bronchitis and pneumonia, inflammation of the stomach, pemphigus neonatorum, suffocation in bed and inattention at birth, out of the causes distinguished in Table 12.

The extent of the decline in infant mortality during the 20 years from 1912–14 to 1933 is analysed for the principal causes in Table XIV and the result is summarized in Table XV.

Table XIV.—Infant Mortality in 1933 per cent. of that in 1912–14, by cause, sex, age and legitimacy.

List No.	——	Under 1 month.	1–3 months.	3–6 months.	6–12 months.	Under 1 year.			
						Total.	Male.	Female.	Illegitimate.
	ALL CAUSES ..	83	52	49	47	62	63	61	54
7	Measles	23	41	13	26	25	26	24	27
9	Whooping Cough ..	61	43	44	44	44	44	44	37
10	Diphtheria and Croup	59	110	47	48	51	48	55	108
11	Influenza	248	246	281	417	321	325	316	?
15	Erysipelas	143	159	250	395	222	228	216	?
24	Tuberculosis of Nervous System ..	—	20	35	43	39	39	38	15
25	Tuberculosis of Intestines and Peritoneum	19	8	10	16	12	14	10	9
23, 26–32	Other tuberculous diseases	21	19	43	42	39	40	38	19
34	Syphilis	35	25	25	19	28	27	29	25
79	Meningitis	47	38	31	27	30	35	24	23
86	Convulsions ..	32	16	15	15	22	23	21	17
106	Bronchitis	41	34	34	27	32	32	32	31
107–109	Pneumonia (all forms)	145	109	100	76	91	93	88	85
	Other diseases of the Respiratory system	48	46	37	22	34	31	38	?
119–20	Diarrhœa and Enteritis	51	45	43	36	41	44	38	42
118 (1)	Inflammation of stomach	33	18	23	17	21	19	24	18
122	Hernia and Intestinal obstruction ..	124	67	106	121	110	108	114	?
157	Congenital Malformations	149	177	146	151	154	154	154	113
158	Congenital debility	30	26	23	14	26	27	25	?
159	Premature birth ..	96	89	70	43	95	95	94	99
160	Injury at Birth ..	195	223	—	—	196	198	194	112
161 (*a*)	Atelectasis	111	58	—	—	108	110	105	89

The risk of dying in the first month of life has fallen by 17 per cent., in the next two months by 48 per cent., at 3–6 months by 51 per cent., at 6–12 months by 53 per cent., or within the first year by 38 per cent. When the causes are considered separately

Table XV.—Change from 1912–14 to 1933 in Infant Mortality assigned to Various Causes.

Amount of change.		DECREASE, probably attributable to		
Per cent. of 1912–14.	Per 1,000 live births.	A. Improved hygiene, biological changes and preventive measures.	A and B combined.	B. Changes in terminology and medical certification.
− 88	− 1·0	—	Tuberculosis of intestines, etc.	—
− 79	− 1·2	—	—	Inflammation of stomach.
− 78	− 6·7	—	Convulsions.	—
− 75	− 1·9	Measles.	—	—
− 74	− 8·7	—	—	Congenital debility.
− 72	− 1·0	Syphilis.	—	—
− 70	− 0·9	—	—	Meningitis.
− 68	− 5·4	—	Bronchitis.	—
− 66	− 0·4	—	Laryngitis, etc.	—
− 61	− 1·1	Tuberculous Meningitis, other tuberculosis.	—	—
− 59	− 8·7	Diarrhœa and enteritis.	—	—
− 56	− 2·2	Whooping cough.	—	—
− 49	− 0·1	Diphtheria.	—	—
		NO APPRECIABLE CHANGE (10 per cent. or less).		
− 9	− 1·0	Pneumonia.		
− 5	− 1·0	Premature birth.		
+ 8	+ 0·1	Atelectasis.		
+ 10	+ 0·1	Hernia and intestinal obstruction.		
		INCREASE.		
+ 54	+ 2·1	Congenital malformations.		
+ 96	+ 1·1	Injury at birth.		
+122	+ 0·2	Erysipelas.		
+221	+ 0·6	Influenza.		
− 38	−39·0	ALL CAUSES combined.		

they fall into three distinct groups, (*a*) those showing a definite reduction in mortality under 1 year of age, ranging from 49 to 88 per cent. of the 1912–14 rate per 1,000 live births; (*b*) those showing no appreciable change, the rate in 1933 being within 10 per cent. of that 20 years earlier; and (*c*) those showing a definite increase ranging from 54 to 221 per cent.

Considering first the group of declining causes, tuberculous enteritis and peritonitis registers the greatest fall of 88 per cent., the real decline being probably obscured to some extent by changes in medical certification; inflammation of the stomach, congenital debility and meningitis owe most of their decline to the latter cause. In the case of bronchitis and laryngitis, transfer to pneumonia and diphtheria respectively has doubtless contributed to the decline of registered mortality, and more careful inquiry into deaths where

convulsions formed the terminal condition has led to assignment of many of these deaths to other causes. It should be pointed out, however, that in 1912–14 the three causes placed in column B of Table XV were responsible for a rate of 14·7 per 1,000 live births and that this fell by no less than 10·8 by 1933, of which fall 8·7 was due to congenital debility. The causes placed in the central column contributed a reduction of 13·5, so the amount of mortality transferred to other causes must presumably have been between 10 and 20 per 1,000 births.

Of the causes showing a definite increase over the rate of 20 years previously, influenza contributed an increase owing to the epidemic of 1933, no increase being noticeable in 1930. Congenital malformations and injury at birth were together responsible for a rise of 3·2 (from 5·0 to 8·2) in the rate, so only a small portion of the mortality supposed to have been transferred from " congenital debility " and other causes in the B column can have gone to these headings. The very large decline in congenital debility as a registered cause of death, if it does not represent a real change, must be accounted for by transfer to causes other than congenital malformations or injury at birth, thereby masking a part of the decline which has really taken place for some of those causes.

Table XVI.—Infant Mortality by Sex and Legitimacy, 1933.

		Deaths per 1,000 Live Births.						Mortality per cent.				
		All Infants.		Legitimate Infants.		Illegitimate Infants.		Male of Female Infants.			Illegitimate of Legitimate Infants.	
		Male.	Female.	Male.	Female.	Male.	Female.	All Infants.	Legitimate.	Illegitimate.	Male.	Female.
All Causes.	Under four weeks ..	36·23	27·98	35·16	26·85	59·90	52·27	129	131	115	170	195
	4 weeks–3 months ..	11·50	8·29	11·07	7·93	20·95	16·07	139	140	130	189	203
	3–6 months.. ..	9·99	7·50	9·57	7·29	19·24	12·17	133	131	158	201	167
	6–9 „	7·64	5·92	7·53	5·82	10·05	8·04	129	129	125	133	138
	9–12 „	6·47	5·47	6·42	5·33	7·56	8·51	118	120	89	118	160
	Total under 1 year	71·82	55·16	69·75	53·22	117·69	97·06	130	131	121	169	182
All Ages under one Year.	Measles (7)	0·67	0·57	0·67	0·55	0·70	1·11	118	122	63	104	202
	Whooping cough (9)	1·61	1·88	1·61	1·88	1·56	1·67	86	86	93	97	89
	Tuberculosis, all forms (23–32) ..	0·95	0·70	0·97	0·69	0·55	1·03	136	141	53	57	149
	Syphilis (34) ..	0·43	0·36	0·37	0·26	1·87	2·55	119	142	73	505	981
	Convulsions (86) ..	2·21	1·51	2·16	1·47	3·27	2·39	146	147	137	151	163
	Bronchitis and pneumonia (106–109)..	13·67	10·26	13·39	10·06	19·86	14·72	133	133	135	148	146
	Diarrhœa and enteritis (119) ..	7·25	4·96	6·79	4·67	17·29	11·30	146	145	153	255	242
	Developmental and wasting diseases (157–159, 161*a* & *b*)	33·66	26·44	32·95	25·65	49·54	43·60	127	128	114	150	170
	Congenital defects (malformations and atelectasis) (157, 161a) ..	*8·68*	*6·77*	*8·69*	*6·77*	*8·49*	*6·84*	*128*	*128*	*124*	*98*	*101*
	Congenital debility, sclerema and icterus (158, 161b)	*4·30*	*2·95*	*4·16*	*2·82*	*7·24*	*5·57*	*146*	*148*	*130*	*174*	*198*
	Premature birth(159)	*20·69*	*16·73*	*20·09*	*16·06*	*33·80*	*31·19*	*124*	*125*	*108*	*168*	*194*
	Other causes ..	11·37	8·48	10·84	7·99	23·05	18·69	134	136	123	213	234
	All causes	71·82	55·16	69·75	53·22	117·69	97·06	130	131	121	169	182

Table XVI contrasts the mortality of male with that of female, and of legitimate with that of illegitimate, infants in 1933. The sex ratio of mortality, when compared with that of previous years (*see* Table XVI, Review for 1932), shows no unusual features. For the separate causes distinguished, other than whooping cough, male excess ranges from 18 per cent. for measles to 46 for diarrhœa, the congenital debility group and convulsions. The excess mortality of the illegitimate is, as usual, very much greater for syphilis than for any other cause distinguished in the table.

Distribution throughout the country of Infant Mortality from various causes.—Table XVII, which is derived from Table 15, furnishes an analysis by cause of the differences in total mortality under one year of age shown in Table VI.

Table XVII.—Comparison of Infant Mortality from the Principal Causes in Geographical Regions, 1933.

	Measles (7).	Whooping cough (9).	Tuberculosis, all forms (23–32).	Syphilis (34).	Convulsions (86).	Bronchitis and pneumonia (106–109).	Diarrhœa and enteritis (119).	Congenital malformations (157).	Congenital debility (158).	Premature birth (159).	Injury at birth (160).	Suffocation—in bed, or not stated how (182 pt.).	Other Causes.	All Causes.
Differences from Rates for England and Wales per 100,000 Live Births.														
South-East	−46	+ 12	− 9	− 7	−117	−414	− 26	− 69	− 71	−379	− 7	+ 2	− 96	− 1,227
Greater London	−44	+ 25	+ 3	− 4	−135	−362	+188	− 58	− 89	−384	−13	− 7	− 71	− 951
Remainder of South-East	−49	− 9	−27	−13	− 89	−494	−354	− 86	− 44	−371	+ 2	+14	−129	− 1,649
North	+31	− 8	+ 8	+ 7	+ 65	+405	+184	+ 35	+ 60	+259	+16	− 2	+158	+ 1,218
North I	+35	− 27	+18	+27	+184	+271	+457	− 4	+111	+366	+ 2	−16	+145	+ 1,569
,, II	− 5	+ 10	+57	−16	+ 93	+209	+121	− 9	+ 79	+111	+43	+ 9	− 31	+ 671
,, III	−17	− 29	− 2	+ 8	+ 23	+332	+ 54	+ 54	− 29	+216	—	+17	+190	+ 817
,, IV	+65	+ 8	− 2	+ 2	+ 29	+549	+151	+ 52	+ 83	+271	+25	− 9	+193	+ 1,417
Midland	+21	− 28	+ 2	+ 9	+ 7	+ 99	− 48	+ 17	+ 8	+136	− 9	− 3	− 58	+ 153
Midland I	+10	− 37	− 4	+ 7	− 23	+ 88	− 15	+ 32	− 17	+196	+ 1	− 3	− 29	+ 206
,, II	+43	− 11	+14	+11	+ 64	+119	−113	− 12	+ 57	+ 19	−28	− 4	−110	+ 49
East	−44	− 27	—	− 6	− 66	−388	−375	− 26	+ 2	+ 38	−99	−10	−134	− 1,135
South-West	−27	+ 11	—	−11	− 56	−497	−421	− 12	− 33	−261	+19	+10	−142	− 1,420
Wales	+49	+ 70	− 4	−10	+290	+278	−123	+129	+ 36	+304	+23	+ 9	+ 3	+ 1,054
Wales I	+65	+ 83	− 5	− 3	+296	+434	− 86	+181	+ 46	+385	+ 5	+ 3	+ 16	+ 1,420
,, II	− 2	+ 30	− 2	−30	+271	−194	−236	− 29	+ 3	+ 58	+77	+27	− 22	− 49
Rates per cent. of those for England and Wales.														
South-East	27	107	89	83	37	66	96	88	77	80	97	105	90	81
Greater London	30	114	104	90	28	70	131	90	71	80	94	84	93	85
Remainder of South-East	22	95	67	68	52	59	42	85	86	80	101	132	87	74
North	149	95	110	118	135	134	130	106	119	114	107	95	116	119
North I	156	84	122	168	198	123	175	99	136	120	101	64	115	125
,, II	92	106	169	60	150	117	120	98	125	106	119	120	97	111
,, III	73	83	98	120	112	128	109	109	91	112	100	139	120	113
,, IV	203	105	98	105	116	146	125	109	127	114	111	80	120	122
Midland	133	84	102	123	104	108	92	103	103	107	96	93	94	102
Midland I	116	79	95	118	88	107	98	105	95	110	100	93	97	103
,, II	168	94	117	128	134	110	82	98	118	101	88	90	89	101
East	30	84	100	85	65	68	39	96	101	102	57	77	86	82
South-West	57	106	100	73	70	59	31	98	89	86	108	123	85	78
Wales	178	140	95	75	255	123	80	122	112	116	110	120	100	117
Wales I	203	148	94	93	258	136	86	131	115	121	102	107	102	122
,, II	97	117	98	25	245	84	62	95	101	103	134	161	98	99

The greatest departures from the average mortality of the whole country in Table 15 are furnished on the one side by North I, which shows excesses under every one of the causes distinguished, except whooping cough, suffocation and congenital debility, producing a net excess of 15·69 deaths per 1,000 live births over the average for England and Wales; and on the other by the South-East, excluding Greater London, with comparatively favourable experience under every head distinguished except suffocation and injury at birth, yielding a total rate 16·49 lower than the general average.

As usual, three causes contribute more than any other to these differences, the three being bronchitis and pneumonia, diarrhœa, and premature birth. The predominant influence of these causes in determining local variations of infant mortality has been evident in each of the last eleven years. Jointly they account in 1933 for 70 per cent. of the divergence above the mean in North I, and for 74 per cent. of the divergence below the mean in the South-East, excluding Greater London.

Mortality from *bronchitis and pneumonia* (considered jointly because of evidence of interchangeability between these forms of return) shows the usual large excess in the North of England, amounting to 46 per cent. in North IV, 28 in North III, 23 in North I and 17 in North II. In contrast with this the Eastern counties show a rate 32 per cent., and the South-West and South-East outside Greater London 41 per cent. below the mean. Urbanization also is associated with a higher rate for this as for most other forms of infant mortality. Thus in 1933 (Table 14) the county boroughs outside Greater London showed a rate 37 per cent. above, and rural districts 29 per cent. below, the mean mortality from this cause, the divergence increasing from 41 per cent. in the first month to 74 per cent. at 9–12 months of age. Greater London, however, showed a rate only 70 per cent. of that in England and Wales.

Mortality from *diarrhœa* usually increases from South to North, but this sequence is profoundly modified by the extent of urbanization. In London the 1933 rate was 10·70 per 1,000 live births, in the outer ring 8·01, the county boroughs 8·12, other urban districts 4·42, and rural districts 3·36. The connection between diarrhœa mortality of infants in the whole year and the mean air temperature of the September quarter is seen from Table XVIII, where the years are arranged, first for England and Wales and then for London, in ascending order of the mean temperature values. For England and Wales as a whole the relation between diarrhœa rate and the summer temperature is shown by the fact that the average of the first 5 rates in the table is 6·06 and of the last 5 it is 8·15. For London it is more evident. Thus 1933 was one of 5 years in which the Greenwich mean temperature for the September quarter reached 63° F. or over, and these were also the only years in which the London diarrhœa death rate exceeded 9·8, whilst at the other end of the scale the 4 years with the coolest summer quarters were the only years giving rates below 9.

In 1933 North I had the highest rate and the South-West the lowest.

The third chief cause of local differences in infant mortality, *premature birth*, is more closely associated with geographical position than with urbanization, the range being from 121 per cent. of the

Table XVIII.—Infant Mortality from Diarrhœa and Enteritis in London and in England and Wales, and Mean Air Temperatures of the 3rd Quarter, 1921–33.

England and Wales.			London Administrative County.				
Year.	Mean Air Temp. of 3rd quarter °F.	Annual Diarrhœa rate.*	Year.	Mean Air Temp. of 3rd quarter (Greenwich).		Annual Diarrhœa rate.*	
				Actual.	Excess.†	Actual.	Excess.†
1922	56·0	5·57	1922	58·1	2·1	6·26	0·69
1931	56·8	5·20	1931	59·2	2·4	8·94	3·74
1924	58·0	6·32	1927	60·6	2·0	6·97	1·25
1927	58·6	5·72	1924	60·8	2·8	7·89	1·57
1925	58·6	7·47	1925	60·9	2·3	9·72	2·25
1930	58·7	5·43	1930	61·8	3·1	9·07	3·64
1928	58·7	6·21	1923	61·8	2·5	9·07	2·25
1923	59·3	6·82	1928	62·2	3·5	9·52	3·31
1932	59·8	5·91	1926	63·0	2·1	10·78	3·01
1929	60·0	7·14	1932	63·1	3·3	11·78	5·87
1926	60·9	7·77	1929	64·0	4·0	9·93	2·79
1921	61·0	13·79	1921	64·2	3·2	18·63	4·84
1933	62·0	6·13	1933	65·5	3·5	10·70	4·57

* Rate for the whole year, per 1,000 live births.
† *i.e.*, excess over corresponding figure for England and Wales.

general average for Wales I, to 80 per cent. for Greater London and the remainder of the South-East. The low Greater London rate of 14·91 and the comparatively small difference between the rate of 21·23 for all county boroughs outside Greater London and 18·30 for the rural districts (Table 14) suggest that urbanization has little influence on the rate.

Next to these three causes of infant mortality, come, for 1933, congenital malformations, congenital debility, injury at birth and convulsions (Table 12). *Congenital malformation* is steadily increasing in importance amongst the causes of infant deaths, its mortality having risen year by year from 4·16 in 1923 to 5·89 per 1,000 live births in 1933. This increase affects all sections of the population to much the same extent, but mortality in 1933 was highest in Wales I, and comparatively low in Greater London and the rest of the South-East.

Injury at birth has increased since 1918 without intermission except in 1922. Wales II shows the highest rate in 1933, and the East the lowest.

Congenital debility was, as usual, less frequently returned as a cause of death in Greater London than in any region, and the rate for the county boroughs was considerably less than that for the rural districts during the first four four weeks of life. *Convulsions* continued to decline as a registered cause of death, the 1933 rate being only 45 per cent. of that of 10 years earlier and 22 per cent. of that of 20 years earlier (Table XIV). The Greater London rate has fallen from ·98 in 1931 to ·52 in 1933, whereas in Wales the rate is 4·77 and in North I 3·71 per 1,000 live births, the rate decreasing as usual from North to South.

Mortality at Ages over One Year.

Table XIX states the crude and standardized death-rates at all ages for sexes and persons for the whole country, as well as the mortality per million living at different ages, for 1932 and 1933, and in order to provide means of comparison with experience of some twenty years back, for 1911–14.

Table XIX.—Mortality from all Causes per Million Population, 1911–14, 1932, and 1933.

	Males.			Females.			Persons.		
	1911–14.	1932.	1933.	1911–14.	1932.	1933.	1911–14.	1932.	1933.
All Ages.									
Crude	14,890	12,745	12,948	13,065	11,396	11,711	13,948	12,043	12,304
Standardized {A ..	14,841	10,896	10,920	12,260	8,730	8,809	13,475	9,738	9,794
Standardized {B ..	15,911	11,824	11,874	13,713	10,033	10,162	14,779	10,887	10,976
0–	40,588	21,045	19,876	33,917	16,825	15,829	37,270	18,961	17,879
5–	3,304	2,201	2,268	3,255	1,937	2,120	3,279	2,070	2,194
10–	1,972	1,443	1,481	2,055	1,325	1,375	2,014	1,385	1,429
15–	2,942	2,535	2,552	2,683	2,245	2,270	2,811	2,390	2,411
20–	3,721	3,247	3,285	3,200	2,821	2,922	3,450	3,030	3,100
25–	4,912	3,336	3,507	4,057	3,105	3,208	4,464	3,216	3,353
35–	8,033	5,315	5,714	6,437	4,336	4,635	7,205	4,785	5,130
45–	14,808	10,831	11,676	11,363	8,010	8,332	13,018	9,319	9,879
55–	29,767	23,431	23,733	22,471	17,021	17,300	25,905	20,045	20,327
65–	62,844	57,949	56,715	50,722	43,328	44,009	56,124	49,864	49,698
75–	135,490	137,962	139,423	114,126	111,818	114,443	122,694	122,188	124,354
85 and upwards	271,337	289,190	286,550	237,360	254,671	259,386	249,201	265,615	268,062

A. English Standard (Population of England and Wales, 1901). B. International Standard.

(*See* page 1.)

The mortality of children under 5 and of males aged 65–75 and 85 and upwards was lower than in 1932, but at all other ages distinguished in Table XIX it was slightly higher. At every age-group under 75 for both males and females mortality was lower than in 1911–14.

The extent of the fall at the various ages can be better appreciated from Table XX, in which the mortality in 1932 and 1933 is expressed as a percentage of the rate in the period 1911–14.

At " all ages " for both sexes the decline in the crude death-rate amounts to 12 per cent. (14 per cent. in 1932), which on standardization according to the English standard is increased to 27 per cent.

(28 per cent. in 1932). The fall is much greater at 0–5 than at any higher age, amounting in 1933 to about 51 per cent. for males and 53 for females.

Table XX.—Mortality at various ages from all causes in 1932 and 1933 per cent. of that for the same sex and age in 1911–14.

	Males.		Females.		Persons	
	1932.	1933.	1932.	1933.	1932.	1933.
All Ages—						
Crude	85·6	87·0	87·2	89·6	86·3	88·2
Standardized A	73·4	73·6	71·2	71·9	72·3	72·7
Standardized B	74·3	74·6	73·2	74·1	73·7	74·3
0–	52	49	50	47	51	48
5–	67	69	60	65	63	67
10–	73	75	64	67	69	71
15–	86	87	84	85	85	86
20–	87	88	88	91	88	90
25–	68	71	77	79	72	75
35–	66	71	67	72	66	71
45–	73	79	70	73	72	76
55–	79	80	76	77	77	78
65–	92	90	85	87	89	89
75–	102	103	98	100	100	101
85 and upwards	107	106	107	109	107	108

After infancy the fall very rapidly decreases with advancing age up to early maturity, reaching a minimum of 12 per cent. for males and 9 per cent. for females at 20–25. The extent of fall then increases to 29 per cent. for males and 28 per cent. for females at 35–45. Thereafter the decrease recorded becomes progressively less for each sex and disappears after 75.

Mortality at 75–85 has fluctuated during the last 15 years without showing any progressive improvement. These fluctuations have been mainly governed by the occurrence of influenza epidemics, as may be seen from the fact that in the 6 years with an influenza crude death rate below ·3 per 1,000 (1920, 1921, 1923, 1926, 1928, 1930) male mortality at 75–85 from all causes never exceeded 133 and female mortality never exceeded 109 per 1,000, whereas in the remaining 9 years with influenza above this level, the male rate for all causes ranged from 137 to 154 and the female rate from 112 to 131. In seeking an explanation for the unfavourable rates of recent years, this factor is an important one.

Table XXI measures the effect of changes in the birth-rate upon the mortality rate at 0–5 years in 1911–14 and from 1917 onwards. It shows that in all these years the fall of the birth-

rate has caused some under-statement of mortality at 0–5 for each sex except during the three years 1920–22, when its temporary rise after the war reversed the process. The fall of 52 per cent. shown for this mortality in Table XX is seen to be slightly over-stated from this cause, being reduced to 49 per cent. when allowance is made for its influence.

The crude rate at these ages was the lowest ever recorded, and the standardized rate equalled the low record of 1930.

Table XXI.—Comparison of Crude and Standardized Death-Rates per 1,000 living at Age 0–5, 1911–14 and 1917–33.

	Males.		Females.		Persons.	
	Crude.	Standardized.	Crude.	Standardized.	Crude.	Standardized.
1911–14 ..	40·6	40·8	33·9	34·2	37·3	37·5
1917	31·8	34·3	26·3	28·4	29·1	31·4
1918	38·9	43·1	34·1	37·5	36·5	40·3
1919	32·8	36·6	26·4	29·5	29·6	33·1
1920	36·2	31·8	28·9	26·0	32·5	29·0
1921	32·3	29·2	25·8	23·6	29·1	26·4
1922	30·2	28·5	24·5	23·1	27·4	25·8
1923	24·3	25·0	19·6	20·1	22·0	22·5
1924	25·1	27·3	20·2	21·8	22·6	24·6
1925	25·3	27·1	20·7	22·1	23·0	24·6
1926	23·3	24·9	18·8	20·0	21·1	22·4
1927	23·7	25·2	18·9	20·0	21·3	22·6
1928	21·9	23·3	17·4	18·5	19·7	20·9
1929	26·3	27·7	21·6	22·7	24·0	25·2
1930	20·5	21·4	16·0	16·7	18·3	19·1
1931	22·4	23·1	17·4	18·0	19·9	20·6
1932	21·0	22·0	16·8	17·6	19·0	19·8
1933	19·9	21·2	15·8	16·9	17·9	19·1

Mortality at 1–5.—Table XXII shows that mortality has fallen more rapidly for the years immediately following infancy than for the first year of life itself, so the features of the changes in progress at these ages also call for some consideration. Compared with 1911–14 the decline in 1933 has been least in the first year and greatest in the second, decreasing continuously from the second to the fifth year of life. The second year of life usually manifests the greatest degree of annual variation and would seem to be the age of greatest susceptibility to disurbing factors. That the death-rates of children aged 1–5 are more sensitive than those of infants or older children to environmental factors such as are indicated by urbanisation or density of persons per room was shown in the Review for 1932 (Table XXVIII).

The distribution throughout the country of mortality at these ages is shown in Table XXIII, which may be compared with Table VI (Infant Mortality). The greatest excess over the general average recorded in the table at ages 1–2 is for North I, which

Table XXII.—Mortality per 1,000 living (both sexes), in each of the first Five Years of Life, 1911-14, 1932, and 1933.

Year of Life.	1911–14.	1932.	1933.	1933 per cent. of	
				1911–14.	1932.
0–1	118·16	67·17	64·85	54·9	96·5
1–2	34·06	14·18	13·06	38·3	92·1
2–3	13·68	6·04	5·86	42·8	97·0
3–4	8·32	4·16	4·09	49·2	98·3
4–5	6·14	3·32	3·36	54·7	101·2
0–5 Crude ..	37·27	18·96	17·88	48·0	94·3
0–5 Stand ..	37·52	19·81	19·05	50·8	96·2
1–5 Crude ..	15·62	6·94	6·56	42·0	94·5
1–5 Stand ..	15·54	6·92	6·58	42·3	95·1

shows a rate more than twice the corresponding rates for the Eastern region, the South-West and the South-East. Next in order comes North IV, followed by North II and Wales I, all with rates more than 30 per cent. in excess of the average. At 2–5 North IV shows the highest rate, followed by North I and Wales I. The South-East excluding Greater London has the lowest mortality of any region at both ages, the rates for the South-West being only slightly less favourable. The division of Wales into two regions indicates that Wales II, which is of course mainly rural, had, as in 1931 and 1932, a mortality for the second year of life much below the general average.

The occurrence of a large reduction of mortality at age 1–2 in good years has been pointed out in previous Reviews. It is to be expected that the most susceptible age would also exhibit the greatest range of regional variation. It has been shown that when the regional rates are expressed as percentages of the rate for England and Wales, their range tends to increase during the first two years of life. In 1933 the range was 59–141 at 6–9 months, and 57–142 at 9–12 months, increasing to 59–162 in the second year, and falling to 67–137 at ages 2–5 (Tables XI and XXIII).

The association with urbanization at these four age periods is reflected in the differences between the percentage rates for London and its outer ring, amounting to 40 at 6–9 months, 35 at 9–12 months,

34 at 1–2 years and 23 at 2–5, and by the corresponding differences between the county boroughs and rural districts, namely 57, 60, 65 and 47.

Table XXIII.—Distribution of Mortality in Early Childhood, 1933.

	Deaths per 1,000 living (both sexes).		Mortality per cent. of that in England and Wales.	
	1–2 years.	2–5 years.	1–2 years.	2–5 years.
England and Wales ..	13·06	4·44	100	100
South-East	8·91	3·48	68	78
Greater London ..	9·65	3·81	74	86
Remainder of South-East.	7·76	2·98	59	67
North	18·10	5·84	139	132
North I	21·10	5·90	162	133
,, II	17·12	5·24	131	118
,, III	14·40	5·66	110	127
,, IV	19·11	6·07	146	137
Midland	12·44	3·79	95	85
Midland I	12·26	3·83	94	86
,, II	12·79	3·72	98	84
East	9·18	3·35	70	75
South-West	8·47	3·06	65	69
Wales	15·35	5·38	118	121
Wales I	17·15	5·77	131	130
,, II	9·79	4·22	75	95
County boroughs* ..	17·94	5·54	137	125
Other urban districts* ..	12·36	4·30	95	97
Rural districts* ..	9·41	3·45	72	78
Greater London—				
Administrative County	11·91	4·33	91	98
Outer Ring	7·43	3·31	57	75

* Excluding Greater London.

Causes of Juvenile Mortality.—London mortality at 1–2 years was lower in 1933 than in any of the preceding 11 years, and at 2–5 it was lower than in any of those years except 1931. The London experience for each year from 1922–33, depicted in Table XXIV, indicates that measles, whooping cough and pneumonia have been chiefly responsible for the wide fluctuations in mortality during the second year of life, and when these causes together with influenza are omitted, the residual death-rates have followed a declining course with only slight fluctuations, the 1933 rate being slightly over half of that in 1922.

The chief causes of death in England and Wales at ages 1–5 are set forth in Table XXV, which also provides comparison with 1932 and with 1911–14.

Table XXIV.—Mortality from Various Causes at 1–2 and 2–5 years of Age in London Administrative County in each year 1922 to 1933.

	1–2 years.							2–5 years.	
	Death rate per 1,000 Living.						Death rate per cent. of England and Wales.	Death rate from all causes.	
	Measles.	Whooping cough.	Influenza.	Pneumonia.	Other causes.	All causes.		Per 1,000 Living.	Per cent. of England and Wales.
1922..	8·08	5·16	1·25	12·81	9·47	36·77	148	12·03	155
1923..	1·87	1·47	0·09	4·51	7·31	15·25	81	5·26	93
1924..	6·93	2·12	0·50	9·05	6·64	25·24	115	6·84	117
1925..	1·87	3·42	0·21	5·99	6·21	17·70	82	5·30	87
1926..	5·55	0·99	0·09	6·15	6·33	19·11	104	5·19	99
1927..	1·04	2·38	0·38	6·15	5·95	15·90	81	4·81	83
1928..	8·33	2·01	0·25	5·64	6·32	22·55	139	5·71	114
1929..	1·44	6·19	1·06	9·75	6·19	24·63	105	5·68	86
1930..	7·55	0·61	0·05	4·35	5·97	18·53	135	4·70	101
1931..	0·76	1·59	0·34	5·13	5·46	13·28	85	4·15	86
1932..	6·38	1·78	0·15	3·87	5·98	18·16	128	5·62	124
1933..	0·68	1·89	0·28	4·27	4·78	11·91	91	4·33	98

Mortality from all causes combined at these ages was the lowest yet recorded, being only 42 per cent. of the rate in 1911–14 and 64 per cent. of that in 1921–25. The principal causes showing an increase over the preceding year were influenza, the pneumonias, scarlet fever, diarrhœa, diphtheria, laryngitis, and congenital malformations. On the other hand, measles, each form of tuberculosis, rickets, meningitis, convulsions, bronchitis, inflammation of the stomach, and burns and scalds all established new low records.

Table XXV.—Deaths from Various Causes per Million living at Ages 1–5 Years in 1911–14, 1932 and 1933. (Both Sexes.)

Cause of Death.	Death-rate.			Cause of Death.	Death-rate.		
	1911–14.	1932.	1933.		1911–14.	1932.	1933.
7. Measles	2,673	988	571	105: 2. Laryngitis	152	16	25
8. Scarlet fever	373	92	129	106. Bronchitis	872	207	183
9. Whooping cough	1,216	602	494	107. Broncho-pneumonia ..	2,170	1,367	1,403
10. Diphtheria	781	387	394	108 & 109. Pneumonia (Lobar and not otherwise defined).	866	355	400
11. Influenza	60	148	283				
23. Tuberculosis of Respiratory System.	237	86	72	Other Respiratory Diseases ..	140	68	53
24. Tuberculosis of Nervous System.	705	380	356	118: 1. Inflammation of the Stomach.	94	21	19
25. Tuberculosis of Intestines and Peritoneum.	391	86	69	119 & 120. Diarrhœa and enteritis	1,639	266	300
26–32. Other Tuberculous Diseases.	288	127	98	130. Acute nephritis ..	89	29	28
63: 1. Rickets	172	66	41	157. Congenital malformations.	85	89	97
79. Meningitis	451	126	106	181. Burns and scalds ..	360	184	179
86. Convulsions	460	85	77	Other Violence	274	256	266
				Other Causes	1,071	909	915
				All Causes	15,619	6,939	6,558

It was demonstrated in Table XXIV of the Review for 1931 that the quinquennial rates since 1876–80 at ages 0–5 have fallen continuously, both for tuberculosis of the nervous system and of the intestines and peritoneum. To maintain continuity with that table the rates per 1,000 at 0–5 years in 1933 were 0·36 for the nervous system, 0·08 for the intestines and peritoneum, 0·20 for other forms and 0·64 for all forms of tuberculosis. Expressing the tuberculosis rates at 1–5 years as percentages of those in 1911–14 and 1921–25, the extent of the fall in mortality from these causes for children of pre-school age can be seen from the following :—

Tuberculosis of	1933 per cent. of ..	
	1911–14.	1921–25.
Nervous system	50	74
Intestines and peritoneum	18	36
Respiratory system	30	50
Other organs	34	58

The decline of other infective and respiratory diseases and of meningitis, convulsions and rickets since 1921 is revealed by the annual rates in Table XXVI.

Table XXVI.—Death rates from various causes per million living at ages 1–5 years in each year 1921–1933.

	Measles.	Scarlet Fever.	Whooping Cough.	Diphtheria.	Bronchitis and pneumonia.	Diarrhœa and enteritis.	Meningitis.	Convulsions.	Rickets.
1921 ..	603	198	853	778	3,305	990	288	321	109
1922 ..	1,530	229	1,838	723	4,461	403	263	268	86
1923 ..	1,332	169	745	464	2,700	479	233	219	98
1924 ..	1,155	149	716	438	3,368	424	205	189	94
1925 ..	1,326	172	1,108	473	3,033	466	188	191	102
1926 ..	848	105	749	474	2,784	502	165	153	86
1927 ..	950	90	743	448	3,339	358	157	133	80
1928 ..	1,122	92	572	504	2,250	368	120	99	102
1929 ..	965	102	1,411	533	3,940	419	138	117	89
1930 ..	1,142	116	401	552	1,792	276	111	89	78
1931 ..	923	87	540	427	2,487	271	114	87	80
1932 ..	988	92	602	387	1,929	266	126	85	66
1933 ..	571	129	494	394	1,986	300	106	77	41

The most favourable years for measles were 1933 and 1921, and for whooping cough 1930 and 1933, the worst years for the latter being 1922, 1929 and 1925. Scarlet fever and diphtheria rates moved downwards together from 1922 to 1924, and from 1930 to 1931, and upwards in unison from 1924 to 1925, 1927 to 1930 and 1932 to 1933. Bronchitis and pneumonia mortality fell below 2 per 1,000 only in the years 1930, 1932, 1933, and below 3 per 1,000 also in 1928, 1931, 1923, 1926; the low rates of the last 3 years are the more remarkable in view of the high influenza prevalence, particu-

larly in 1933, the other four years of low mortality being characterised by absence of influenza epidemics. Meningitis, other than cerebro-spinal or tuberculous, is rapidly disappearing as a certified cause of death.

Mortality of the Aged.—The rapid increase in the relative magnitude of this section of the population continues to form an outstanding feature of our vital statistics. Persons over 70 years of age were 297 per 10,000 total population in 1911, 344 in 1921, and 426 in 1931, and were estimated as forming 443 per 10,000 in 1933.

Table XXVII.—Mortality over 70 Years of Age in 1911–20, 1921–30, 1931, 1932, and 1933, from the chief Causes of Death.

	Deaths from each Cause per 1,000 Total Deaths.					Mortality per 1,000 Living.				
	1911–20.	1921–30.	1931.	1932.	1933.	1911–20.	1921–30.	1931.	1932.	1933.
MALES.										
Influenza (11)	20	26	23	23	37	2·3	2·8	2·6	2·6	4·1
Cancer (45–53)	81	107	113	119	116	9·4	11·8	12·6	13·2	12·8
Heart Diseases (90–95)	148	205	300	308	317	17·1	22·7	33·3	34·0	34·9
Disease of Blood Vessels, including Cerebral Hæmorrhage (82, 96, 97, 99 and 100)	163	195	171	170	166	18·8	21·6	19·0	18·8	18·3
Bronchitis (106)	137	110	78	63	63	15·9	12·1	8·7	7·0	7·0
Pneumonia (107–109)	34	35	32	31	31	4·0	3·9	3·6	3·4	3·4
Chronic Nephritis (131 and 132)	29	29	33	35	32	3·3	3·2	3·7	3·9	3·5
Old Age (162)	222	140	87	87	79	25·7	15·5	9·7	9·6	8·7
Other Causes	166	153	163	163	158	19·0	17·2	17·7	18·0	17·4
All Causes	1,000	1,000	1,000	1,000	1,000	115·5	110·8	111·1	110·5	110·1
FEMALES.										
Influenza (11)	24	31	31	31	50	2·3	3·0	3·0	2·9	4·8
Cancer (45–53)	87	105	107	109	108	8·7	10·2	10·3	10·2	10·4
Heart Diseases (90–95)	153	223	315	322	329	15·2	21·6	30·2	30·2	31·6
Disease of Blood Vessels, including Cerebral Hæmorrhage (82, 96, 97, 99 and 100)	157	181	164	170	159	15·5	17·6	15·7	15·9	15·2
Bronchitis (106)	149	117	87	69	70	14·8	11·4	8·2	6·5	6·7
Pneumonia (107–109)	32	34	33	33	32	3·2	3·3	3·2	3·1	3·1
Chronic Nephritis (131 and 132)	21	23	28	29	27	2·1	2·2	2·7	2·7	2·6
Old Age (162)	248	165	109	111	100	24·6	16·0	10·5	10·4	9·6
Other Causes	129	121	126	127	124	12·7	11·7	11·9	11·9	11·9
All Causes	1,000	1,000	1,000	1,000	1,000	99·0	97·0	95·8	93·8	96·1
PERSONS.										
Influenza (11)	22	29	28	27	44	2·3	3·0	2·9	2·8	4·5
Cancer (45–53)	85	106	111	114	112	9·0	10·8	11·3	11·4	11·4
Heart Diseases (90–95)	151	215	308	316	324	16·0	22·0	31·5	31·8	33·0
Disease of Blood Vessels, including Cerebral Hæmorrhage (82, 96, 97, 99 and 100)	159	187	167	170	162	16·9	19·2	17·1	17·1	16·5
Bronchitis (106)	144	114	82	67	67	15·2	11·7	8·4	6·7	6·8
Pneumonia (107–109)	33	34	33	32	32	3·5	3·5	3·4	3·2	3·2
Chronic Nephritis (131 and 132)	24	26	30	32	29	2·6	2·6	3·1	3·2	3·0
Old Age (162)	237	154	100	100	91	25·0	15·8	10·1	10·1	9·3
Other Causes	145	135	141	143	139	15·3	14·0	14·3	14·4	14·2
All Causes	1,000	1,000	1,000	1,000	1,000	105·8	102·7	102·1	100·7	101·9

The causes of death at ages over 70 are grouped, as in previous years, in Table XXVII. The year was noteworthy for its low mortality rates from bronchitis and pneumonia combined with a high mortality attributed to influenza at these ages. The cancer rate increased slightly for females, but not for males.

Centenarians.—Among the deaths registered during the year there were 110 of reputed centenarians, 19 of whom were males and 91 females. In the preceding three years the numbers were 61, 91, and 109 respectively. Particulars of the ages returned and of the regions concerned are given in Table XXVIII.

Table XXVIII.—Age at Death of Centenarians, 1933.

	Males.						Females									
	100 and over	100	101	102	103	104	100 and over	100	101	102	103	104	105	106	107	108
Greater London ..	4	2	1	1	—	—	17	10	5	—	1	—	—	1	—	—
Remainder of South-East	3	—	1	—	1	1	26	12	6	2	2	3	1	—	—	—
North	5	3	2	—	—	—	9	4	3	2	—	—	—	—	—	—
Midlands	2	1	—	1	—	—	12	6	1	2	2	—	1	—	—	—
East	2	1	1	—	—	—	10	5	2	1	1	1	—	—	—	—
South-West	3	1	1	1	—	—	10	4	3	—	2	—	—	—	—	1
Wales	—	—	—	—	—	—	7	3	1	2	1	—	—	—	—	—
England and Wales ..	19	8	6	3	1	1	91	44	21	9	9	4	2	1	—	1

Mortality at Single Years of Age.

For 1933, as for previous years, the deaths of all males and of females according to marital condition, are given at each year of age in Table 19. The distinction of marital condition is not possible for males since this information is not afforded by the registers. In Table XXIX the deaths at each year of age for the 3 year period 1930–32, symmetrically disposed about the census, have been combined, and the mortality rates resulting from division of these numbers by 3 times the census populations at the corresponding ages are shown in Table XXX. Similar data for the periods 1910–12 and 1920–22 were presented in Tables XXXIII–IV of the Report for 1912 and Tables XXV–VI of the 1923 Review respectively.

As in 1910–12 and 1920–22, the deaths reveal irregularities at certain ages attributable to errors of statement of age, which are also noticeable in the census returns of the living, these errors being mainly of " round numbers " and of " even numbers." The piling up of deaths recorded at 38–40, and the excess at 32, 42, 50, 52, 54, 56, 58, 60, 65, 70, 72, and the deficiency at 55, compared with the numbers expected from a smooth progression, have all been noticed previously. Of these, the continued aversion to 55, with resulting transfer to 54, is the most remarkable feature, since it is not noticed at 45, 65 or 75, the preference for the " round number "

5 being usually stronger than the tendency to state the nearest even number. The excess noticed previously at 38, 45 and 62, is now scarcely evident, but the preference for 69 and 70 over 71 is repeated for males.

Table XXIX.—Deaths at each year of age in the three years, 1930–32.

Age.	Males.	Females.	Age.	Males.	Females.	Age.	Males.	Females.
All Ages	729,442	701,744	33	2,982	3,173	67	16,153	13,931
0	69,994	50,786	34	3,148	3,358	68	16,454	14,663
1	14,012	12,024	35	3,394	3,332	69	16,787	14,941
2	5,940	5,337	36	3,505	3,547	70	16,742	15,638
3	4,015	3,623	37	3,501	3,492	71	16,001	15,274
4	3,329	3,056	38	3,947	3,711	72	17,347	17,046
5	3,263	2,781	39	3,998	3,903	73	16,924	17,093
6	2,556	2,235	40	4,220	4,052	74	17,027	17,317
7	2,130	1,815	41	4,281	3,782	75	16,055	17,489
8	1,810	1,612	42	5,024	4,484	76	15,452	17,260
9	1,773	1,570	43	4,993	4,361	77	14,363	15,999
10	1,745	1,477	44	5,260	4,401	78	13,605	16,245
11	1,537	1,382	45	5,998	4,787	79	12,705	15,554
12	1,285	1,300	46	6,113	5,091	80	11,379	14,793
13	1,222	1,287	47	6,463	5,510	81	9,944	13,451
14	1,516	1,432	48	6,921	5,868	82	9,169	12,537
15	1,908	1,809	49	7,663	6,327	83	7,765	11,556
16	2,366	2,215	50	8,001	6,452	84	6,837	10,708
17	2,733	2,488	51	7,859	6,482	85	5,812	9,435
18	2,971	2,576	52	8,972	7,492	86	4,948	8,453
19	3,084	2,820	53	9,146	7,541	87	3,918	6,880
20	3,277	2,800	54	9,834	8,020	88	2,925	5,647
21	3,396	2,943	55	9,808	7,792	89	2,310	4,533
22	3,360	3,091	56	11,013	8,745	90	1,809	3,737
23	3,442	3,082	57	11,188	8,941	91	1,332	2,775
24	3,266	3,202	58	12,085	9,762	92	873	2,205
25	3,200	3,115	59	12,545	9,853	93	667	1,587
26	3,170	3,104	60	12,566	10,135	94	464	1,095
27	3,239	3,210	61	12,324	10,051	95	317	822
28	3,236	3,201	62	13,900	11,491	96	193	517
29	3,281	3,255	63	14,420	12,092	97	122	379
30	3,202	3,206	64	14,893	12,533	98	80	256
31	3,149	3,157	65	15,992	13,535	99	55	167
32	3,192	3,368	66	15,304	13,093	100 and over.	48	213

Table XXX.—Annual death rates per 1,000 living at each year of age in the three years, 1930–32.

Age.	Males.	Females.	Age.	Males.	Females.	Age.	Males.	Females.
All Ages	12·7	11·2	33	3·8	3·4	67	46·4	33·8
0	76·5	57·0	34	4·0	3·5	68	50·0	37·0
1	15·6	13·6	35	4·4	3·6	69	56·7	41·6
2	6·6	6·1	36	4·5	3·8	70	60·5	44·0
3	4·5	4·1	37	4·7	3·9	71	66·6	49·6
4	3·6	3·4	38	5·0	4·0	72	77·7	57·6
5	3·4	3·0	39	5·3	4·4	73	83·3	63·1
6	2·6	2·4	40	5·4	4·4	74	91·6	68·5
7	2·1	1·9	41	6·0	4·7	75	98·0	76·9
8	1·8	1·6	42	6·6	5·1	76	109·2	85·9
9	1·6	1·5	43	6·8	5·1	77	121·8	92·6
10	1·5	1·3	44	7·4	5·3	78	132·0	106·5
11	1·3	1·2	45	8·3	5·7	79	147·3	116·6
12	1·6	1·6	46	8·6	6·2	80	148·9	119·7
13	1·5	1·6	47	9·4	6·9	81	174·6	143·5
14	1·6	1·6	48	9·6	7·0	82	188·3	151·9
15	2·0	1·9	49	10·7	7·8	83	204·8	169·3
16	2·2	2·1	50	10·9	7·7	84	221·1	183·2
17	2·6	2·4	51	12·1	9·0	85	238·3	200·1
18	2·9	2·4	52	13·5	9·8	86	252·3	216·1
19	3·0	2·7	53	14·1	10·3	87	278·5	231·1
20	3·2	2·7	54	15·1	10·9	88	286·9	249·3
21	3·3	2·7	55	15·6	11·2	89	308·1	270·3
22	3·3	2·8	56	17·8	13·0	90	314·9	290·6
23	3·4	2·8	57	19·3	14·2	91	387·4	308·5
24	3·2	3·0	58	20·5	15·0	92	368·4	347·0
25	3·2	2·9	59	23·1	16·7	93	431·7	360·4
26	3·2	2·9	60	23·6	16·8	94	422·6	369·4
27	3·3	3·1	61	26·7	19·8	95	442·1	403·5
28	3·3	3·1	62	29·6	21·9	96	491·1	426·6
29	3·5	3·3	63	32·3	23·5	97	391·0	435·6
30	3·3	3·1	64	35·0	25·7	98	533·3	422·4
31	3·5	3·2	65	40·0	28·4	99	447·2	403·4
32	3·8	3·5	66	42·3	30·2	100 and over.	592·6	550·4

The years of age after the second year at which the smallest and greatest numbers of deaths were registered and at which female deaths exceeded male deaths were as follows:

	Deaths Minimal.		Deaths Maximal. (after 2nd year)		Ages having a female excess.
	Males.	Females.	Males.	Females.	
1910–12	12	12	70	72	7, 8, 12–16, 70 and up.
1920–22	12	11	69	76	5, 10, 12–15, 21, 23–33, 71 and up.
1930–32	13	13	72	75	12, 13, 30–34, 36, 73 and up.

The excess of female over male deaths at 12–13, and at ages from 73 onwards, has been noticed at each period. The excess at 23–33 in 1920–22 was due to depletion of the young male population by the war and this also accounts for the female excess of deaths at 30–34 and 36 in 1930–32. The constancy of male deaths at successive years of age between 18 and 31 was commented upon in 1923, and it is now evident from 20 to 34 for males and also at 24 to 33 for females. It arises from a levelling out of the mortality risks between 20 and 30, combined with the effect of the falling birth-rate during the present century upon the population curve at these ages. Table XXX indicates that between 20 and 30 the male death-rate increased only from 3·2 to 3·3, and the female rate from 2·7 to 3·1, whereas in 1910–12 the increases were from 3·6 to 4·5 and 2·9 to 3·8 respectively. This is depicted also in Diagram 1.

The progression of death-rates of children at the school ages 5–15 is shown below, comparison being also made with the corresponding rates of 10 and 20 years ago.

Age			5	6	7	8	9	10	11	12	13	14	15
Rates per 10,000 living	Boys	1910–12	50	37	28	24	21	20	19	18	18	20	23
		1920–22	43	34	27	23	20	18	18	17	18	19	22
		1930–32	34	26	21	18	16	15	(13)	(16)	15	16	20
	Girls	1910–12	49	37	28	24	21	20	19	18	21	23	25
		1920–22	44	31	26	21	19	19	17	18	20	21	24
		1930–32	30	24	19	16	15	13	(12)	(16)	16	16	19
Per cent. fall from 1910–12 to 1930–32	Boys		32	30	25	25	24	25	32	11	17	20	13
	Girls		39	35	32	33	29	35	(37)	(11)	24	30	24

The relative improvement since 1910–12 has been greater for girls than boys at each age except at 12. The irregularity of the 1930–32 rates and curves (Diagram 1) at ages 11–12 is due to the sudden changes in birth rate from 1916 to 1920 which make the rates based on 3 times the census population inaccurate at ages 11–14 in 1930–32. Using the more accurate sums of the estimated populations of the 3 years at ages 10, 11, 12, 13, 14, the resulting rates per 100,000 children living at these ages are 141, 139, 139, 151, 166, showing a smooth progression with minimum at 11–12, whereas by the method used the successive rates are 140, 129, 157, 158, 160.

At other ages the error involved in substituting 3 times the census population for the sum of the estimated populations of the years 1930–32 is of no consequence, the former method of estimating the total population at risk having in fact certain advantages at ages after childhood, since the 1930 population at individual ages was necessarily built up from the preceding census of 1921. The only ages at which the female rate equalled or exceeded the male

DIAGRAM 1. DEATH RATES PER 1000 LIVING AT AGES 5 TO 30.

1910-12 MALES ..... FEMALES ..... 1930-32 MALES ___ FEMALES _._._.

rate were 12–14 (6–16 in 1910–12, and 5, 10, 12–15 in 1920–22) and 97, the latter being evidently a statistical accident owing to irregularities due to mis-statement of age by males at the census.

Mortality of Women according to Marital Condition.

Table XXXI gives the deaths in the triennium 1930–32 at each year of age from 15 onwards for single, married, and widowed or divorced women, and Table XXXII gives, for each year and quin-

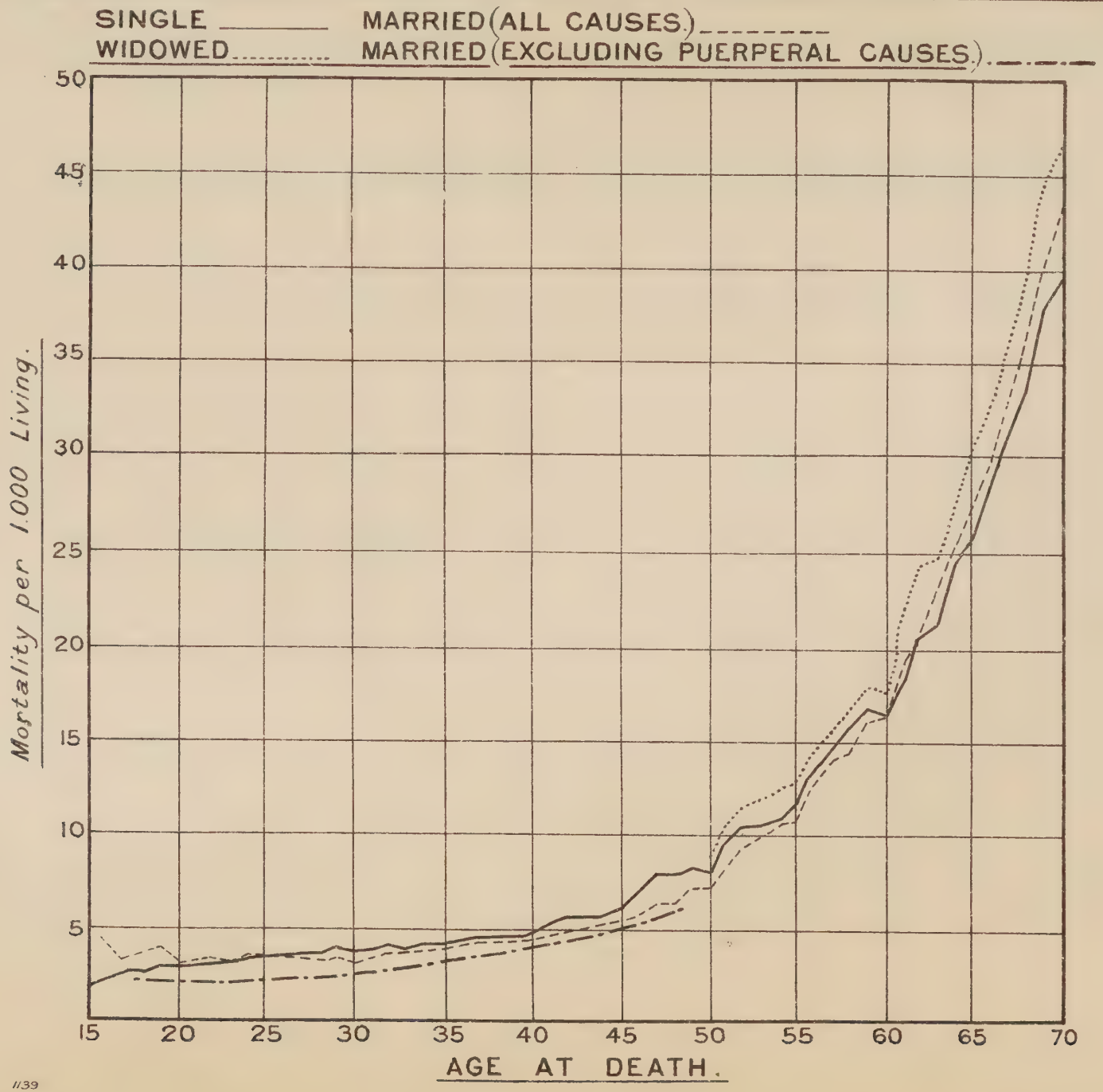
Table XXXI.—Deaths of Single, Married and Widowed Females at each year of age from 15 upwards in the three years 1930–32.

Age.	Single.	Married.	Widowed and Divorced.	Age.	Single.	Married.	Widowed and Divorced.
Total 15 years & upwards	117,669	240,726	251,632	57	1,407	5,755	1,779
				58	1,612	6,027	2,123
15	1,809	—	—	59	1,544	6,014	2,295
16	2,210	5	—	60	1,577	5,922	2,636
17	2,465	23	—	61	1,497	5,774	2,780
18	2,488	88	—	62	1,708	6,354	3,429
19	2,583	237	—	63	1,731	6,660	3,701
20	2,464	335	1	64	1,833	6,581	4,119
21	2,386	555	2	65	1,945	6,566	5,024
22	2,268	819	4	66	1,919	6,102	5,072
23	2,021	1,053	8	67	2,032	6,232	5,667
24	1,821	1,366	15	68	2,108	6,238	6,317
25	1,589	1,504	22	69	2,198	5,940	6,803
26	1,430	1,656	18	70	2,251	5,889	7,498
27	1,345	1,835	30	71	2,275	5,419	7,580
28	1,177	1,985	39	72	2,474	5,532	9,040
29	1,121	2,100	34	73	2,397	4,975	9,721
30	990	2,152	64	74	2,356	4,744	10,217
31	872	2,215	70	75	2,521	4,198	10,770
32	895	2,390	83	76	2,415	3,828	11,017
33	808	2,277	88	77	2,178	3,236	10,585
34	806	2,448	104	78	2,200	2,933	11,112
35	766	2,440	126	79	2,141	2,494	10,919
36	771	2,622	154	80	2,075	2,163	10,555
37	764	2,559	169	81	1,875	1,662	9,914
38	804	2,756	151	82	1,786	1,465	9,286
39	778	2,891	234	83	1,605	1,133	8,818
40	849	2,952	251	84	1,468	884	8,356
41	793	2,735	254	85	1,383	627	7,425
42	924	3,201	359	86	1,164	527	6,762
43	883	3,130	348	87	957	361	5,562
44	843	3,135	423	88	781	266	4,600
45	912	3,360	515	89	651	163	3,719
46	996	3,534	561	90	558	122	3,057
47	1,067	3,849	594	91	414	64	2,297
48	1,104	4,034	730	92	317	49	1,839
49	1,090	4,375	862	93	235	30	1,322
50	1,124	4,445	883	94	156	15	924
51	1,135	4,418	929	95	122	12	688
52	1,263	5,075	1,154	96	62	7	448
53	1,198	5,118	1,225	97	61	2	316
54	1,268	5,367	1,385	98	42	2	212
55	1,295	5,038	1,459	99	21	1	145
56	1,407	5,680	1,658	100 and over	35	1	177

Table XXXII.—Annual death-rates of Single, Married and Widowed Females per 1,000 living at quinquennial groups of ages and at each year of age from 15 upwards in the three years 1930–32.

Age.	Single.	Married.	Widowed and Divorced.	Age.	Single.	Married.	Widowed and Divorced.
15–20	2·3	3·8	—	49	8·3	7·5	9·5
20–25	2·7	3·0	4·3	50	8·2	7·4	8·8
25–30	3·2	3·0	4·1	51	9·8	8·5	10·4
30–35	3·6	3·2	4·6	52	10·4	9·4	11·4
35–40	4·1	3·9	4·7	53	10·4	9·9	11·7
40–45	5·5	4·7	5·5	54	10·9	10·6	12·3
45–50	7·5	6·4	8·0	55	11·7	10·8	12·5
50–55	9·9	9·1	11·0	56	13·1	12·6	14·1
55–60	14·3	13·4	15·3	57	14·4	13·8	15·3
60–65	20·4	20·7	23·4	58	15·9	14·3	16·3
65–70	31·0	32·5	36·5	59	16·7	16·2	18·1
70–75	50·7	52.4	59·2	60	16·5	16·4	18·0
75–80	86·6	84·2	97·7	61	18·8	19·1	22·1
80–85	143·5	134·2	151·0	62	21·2	21·0	24·3
85–90	225·2	184·2	228·2	63	21·9	23·3	24·8
90–95	324·3	213·6	324·5	64	24·4	25·1	27·4
95–100	369·3	173·9	434·1	65	25·7	27·7	30·7
100 and over.	530·3	166·7	561·9	66	28·4	29·3	32·1
				67	31·1	32·9	36·2
15	1·9	—	—	68	33·5	35·9	39·6
16	2·1	4·4	—	69	38·4	40·0	44·2
17	2·4	3·2	—	70	39·0	43·3	46·3
18	2·4	3·4	—	71	47·1	47·9	51·8
19	2·6	4·0	—	72	54·5	54·8	60·5
20	2·6	2·9	2·6	73	57·0	58·8	67·5
21	2·7	2·9	2·8	74	61·6	65·8	71·8
22	2·8	3·0	3·4	75	72·1	70·7	80·9
23	2·8	2·9	4·2	76	80·5	79·4	89·7
24	2·9	3·1	5·4	77	86·4	87·7	95·7
25	2·9	3·0	5·6	78	98·1	97·8	111·0
26	3·0	2·9	3·4	79	108·8	105·5	121·3
27	3·3	3·0	4·6	80	115·2	115·1	121·6
28	3·3	3·0	4·6	81	137·9	124·9	148·3
29	3·6	3·1	3·2	82	149·3	148·2	153·0
30	3·4	2·9	4·7	83	166·3	158·0	171·5
31	3·5	3·1	4·6	84	179·9	166·9	185·7
32	3·8	3·4	4·7	85	206·4	165·7	202·5
33	3·7	3·3	4·5	86	213·0	199·6	218·1
34	3·8	3·4	4·4	87	230·5	175·4	236·0
35	3·8	3·5	4·7	88	242·6	204·8	253·7
36	3·9	3·7	5·0	89	273·3	211·4	273·1
37	4·2	3·8	4·9	90	287·9	227·2	294·3
38	4·3	3·9	3·6	91	315·8	187·1	312·9
39	4·5	4·3	5·2	92	352·2	226·9	351·1
40	4·9	4·3	4·8	93	382·1	277·8	359·1
41	5·3	4·5	5·1	94	374·1	138·9	378·8
42	5·8	4·8	5·8	95	380·1	307·7	410·3
43	5·8	4·9	5·3	96	299·5	166·7	465·2
44	5·8	5·1	6·2	97	462·1	95·2	440·7
45	6·3	5·5	6·9	98	411·8	133·3	433·5
46	7·2	5·8	7·3	99	291·7	47·6	451·7
47	8·0	6·6	7·5	100 and over	530·3	166·7	561 9
48	8·0	6·6	8·3				

DIAGRAM 2. MORTALITY OF WOMAN ACCORDING TO MARITAL CONDITION, 1930-32.



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quennium of age, the mortality rates obtained by dividing these deaths by 3 times the corresponding census populations. The rates at ages 15 to 70 are depicted in Diagram 2. Similar compilations for 1910–12 and 1920–22 are to be found in Tables XXXV–VI of the Report for 1912 and Tables XXVII–VIII of the Review for 1923. A comparison of mortality risks of the single and married with the corresponding risks 10 and 20 years ago is of special interest having regard to the great emphasis at present being placed upon the dangers of childbearing. Table XXXIII makes such a comparison at quinquennial ages from 15 to 85, and the last columns

Table XXXIII.—Mortality per 10,000 living of single and married women at quinquennial ages, 1910–12, 1920–22, and 1930–32.

Age.	1910–12.			1920–22			1930–32.			1930–32 per cent. of 1910–12.		
	Single.	Married.	Diffce.	Single.	Married.	Diffce.	Single.	Married.	Diffce.	Single	Married.	Widowed or Divorced.
15–	26	62	+ 36	26	43	+ 17	23	38	+ 15	88	61	—
20–	29	39	+ 10	31	37	+ 6	27	30	+ 3	93	77	68
25–	33	39	+ 6	35	38	+ 3	32	30	− 2	97	77	73
30–	43	46	+ 3	40	41	+ 1	36	32	− 4	84	70	75
35–	53	59	+ 6	47	49	+ 2	41	39	− 2	77	66	60
40–	69	72	+ 3	61	56	− 5	55	47	− 8	80	65	58
45–	96	92	− 4	83	72	− 11	75	64	− 11	78	70	62
50–	127	124	− 3	114	101	− 13	99	91	− 8	78	73	67
55–	173	179	+ 6	154	144	− 10	143	134	− 9	83	75	68
60–	257	254	− 3	219	218	− 1	204	207	+ 3	79	81	75
65–	369	372	+ 3	338	341	+ 3	310	325	+ 15	84	87	85
70–	584	591	+ 7	532	530	− 2	507	524	+ 17	87	89	83
75–	919	906	− 13	860	847	− 13	866	842	− 24	94	93	94
80–85	1,419	1,347	− 72	1,364	1,242	−122	1,435	1,342	− 93	101	100	98

show the relative decline in mortality rates since 1910–12 for the single, married, and widowed or divorced.

At every age up to 60 the mortality of the married has fallen to a greater extent than that of the single, and at every age except 30–35 and 75–80 the mortality of the widowed has fallen more than that of the married. At ages 20–30 the mortality risk for married women has declined by 23 whereas for single women it has declined by only 3 to 7 per cent.; at ages 30–50 the risk for the married has fallen by 30 to 35 per cent., but for single women by only 16 to 23 per cent. This greater rate of improvement in vitality of the married than the single at ages up to 60 was progressive during the 20 years; in 1910–12 the married were at a disadvantage at every quinquennium of age up to 45, in 1920–22 at every quinquennium up to 40, but in 1930–32 the mortality risk had become greater for the single women at each age group from 25 to 60.

In Table XXXIV the 1930–32 rates for married and single women from puerperal causes, and other than puerperal causes, are compared at each quinquennium of age from 15 to 55 with the corresponding rates in the decennium 1911–20.

Table XXXIV.—Mortality, per million living, of single and married women from puerperal and other causes, by age, 1911–20 and 1930–32.

Age.	1911–20.						1930–32.					
	All causes.		Puerperal causes.		Causes other than puerperal.		All causes.		Puerperal causes.		Causes other than puerperal.	
	S.	M.	S.	M.	S.	M.	S.	M.	S.	M.	S.	M.
15–	3,179	5,720	31	2,019	3,148	3,701	2,274	3,785	17	1,351	2,257	2,434
20–	3,662	4,422	69	990	3,593	3,432	2,743	2,985	41	743	2,702	2,242
25–	4,337	4,662	66	795	4,271	3,867	3,163	2,984	43	623	3,120	2,361
30–	5,100	4,886	68	709	5,032	4,177	3,613	3,219	59	557	3,554	2,662
35–	5,993	5,774	50	666	5,943	5,108	4,135	3,855	53	455	4,082	3,400
40–	7,529	6,743	24	361	7,505	6,382	5,502	4,700	27	243	5,475	4,457
45–	10,203	8,763	1	49	10,202	8,714	7,517	6,370	3	30	7,514	6,340
50–55	13,715	11,904	—	2	13,715	11,902	9,901	9,102	—	—	9,901	9,102
15–55*	6,715	6,609	39	699	6,676	5,910	4,856	4,625	30	500	4,826	4,125

* Equivalent average death rates, that is, standardized rates based upon a population uniformly distributed according to age.

The legitimate birth rate per 1,000 married women aged 15–45 was 173 in 1911–20 and 122 in 1930–32, a fall of 29 per cent., and the birth rate amongst single women declined by a similar proportion. This accounts for the drop in the average puerperal mortality risk for married women at each age, and for single women at each age under 35, the relative change in the puerperal risk, expressed as a percentage of the 1911–20 rate at each age, being as follows :—

	15–	20–	25–	30–	35–	40–45
Single	— 45	— 41	— 35	— 13	+ 6	+ 12
Married	— 33	— 25	—22	— 21	— 32	— 33

After excluding the different risks due to childbearing, the mortality rates from non-puerperal causes amongst married women per cent. of those amongst single women of the same ages are as follows : -

	15–	20–	25–	30–	35–	40–	45–	50–55
1911–20	118	96	91	83	86	85	85	87
1930–32	108	83	76	75	83	81	84	92

At every quinquennium of age from 20 to 55 the married women have a lower non-puerperal mortality than single women, and this advantage has increased in recent years; in 1911–20 it was 4 per cent. of the single rate at 20–25, 9 per cent. at 25–30, and about 15 per cent. after, whilst in 1930–32 it amounted to about 25 per cent. at ages 25–35 and exceeded 15 per cent. at 20–25 and 35–50. This can be seen in Diagram 2.

The relative change in the non-puerperal risk, expressed as a percentage of the 1911–20 rate at each age was as follows :—

	15–	20–	25–	30–	35–	40–	45–	50–55
Single	— 28	— 25	— 27	— 29	— 31	— 27	— 26	— 28
Married ..	— 34	— 35	— 39	— 36	— 33	— 30	— 27	— 24
Widowed ..	—	—	—	— 35	— 36	— 39	— 32	— 31

The improvement has been greater for the married than for the single at each age up to 50, the contrast being especially great at 20–35.

The mortality rates of widowed or divorced women in 1930–32 from non-puerperal causes per cent. of the rates for single women of the same ages, were :—

	25–	30–	35–	40–	45–	50–	55–	60–65
1930–32 ..	121	124	111	99	106	111	108	115

This excess mortality amongst widows at all ages was commented upon in the Review for 1923; the contrast is much less than in 1910–12 at ages under 65, the fall in mortality having been greater amongst widows than either single or married (Table XXXIII). In order to show that when the risk of widowhood with its attendant higher mortality is taken into account, the apparent advantage of the married over the single condition still persists, the death rates of single women have been expressed below as percentages of the rates at the corresponding ages amongst the combined population of married and widowed, both from all causes and from non-puerperal causes.

	15–	20–	25–	30–	35–	40–	45–	50–	55–	60 & up.
1911–20 :										
All causes ..	55	82	91	103	102	109	112	109	106	94
Non-puerperal ..	84	103	108	118	114	114	112	109	106	94
1930–32 :										
All causes ..	60	92	106	111	106	115	115	105	103	91
Non-puerperal ..	93	120	131	131	118	121	115	105	103	91

There is an excess mortality from all causes in the single over the married and widowed at ages 25–60, reaching 15 per cent. at 40–50, and when puerperal causes are excluded there is an excess at ages 20–60, exceeding 30 per cent. at 25–35.

The comparative risks of mortality to married and single may be usefully expressed by the use of a simple form of standardized rate or "equivalent average death-rate"* The populations of single and married present such widely different distributions over the age-scale that, although the population of all women over 15 might be used as a standard, it is simpler and equally useful to postulate a standard population uniformly distributed over the scale of ages between defined limits. Standardized rates of mortality

* G. W. Yule; Journal of Royal Statistical Society, 1934. xcvii, Pt. 1, 15.

between any two ages can then be found by simply calculating the arithmetic mean of the rates at individual years between these ages, or of the rates in quinquennial age groups. If we compare 100,000 married women with the same number of single women aged 15–55 and uniformly distributed over those ages, it follows from Table XXXIV that the numbers dying annually would have been,

in 1911–20 { 672 single women (4 from puerperal, 668 from other causes). / 661 married women (70 from puerperal, 591 from other causes).

in 1930–32 { 486 single women (3 from puerperal, 483 from other causes). / 462 married women (50 from puerperal, 412 from other causes).

Stated in this way, the 100,000 married women would annually suffer in 1930–32 an excess of 47 deaths from puerperal causes (66 in 1911–20), but since 71 fewer would die of other causes (77 in 1911–20), they would enjoy a net advantage amounting to 24 survivors in the year (11 in 1911–20). The deaths saved by a fall in birth rate among married women (from 173 to 122 per 1,000 aged 15–45) totalled 20 of these 100,000 married women, since 70 died from puerperal causes in the first period and 50 in the second, so it may be presumed that even if their birth rate were to return to 173, the married would still enjoy a total survival advantage over the single.

It has been generally supposed that the greater vitality of the married than the single, as evidenced by their lower mortality from non-puerperal causes between ages 20 and 50, is due in large part to the operation of selective recruiting for wedlock. In the words of the Review for 1923 (p. 42) "Women suffering from mortal disease will frequently refrain from marriage, as from migration, and remain to swell the mortality of the ranks from which transfer for them is barred." This factor must be particularly important at the earlier ages when tuberculosis bars many from marriage, but any form of mortal illness which either stands in the way of marriage being contemplated, or prevents it after it has been arranged, virtually results in the transfer of a death from the married to the single group.

It is difficult to explain by selection of this kind, however, why in a period of rapidly falling incidence of most forms of mortal disease, the advantage as regards mortality from non-puerperal causes for the married over the single should have increased at ages 20–25 from 4 per cent. in 1911–20 to 17 per cent. in 1930–32, at ages 25–30 from 9 per cent. to 24 per cent., or at ages 30–35 from 17 to 25 per cent. There are, of course, a certain number of deaths associated with pregnancy or childbirth which are assigned to other causes and yet are contributed to by the puerperal condition, and

with a falling birth rate these too will have diminished to a greater extent for the married than the single. It is estimated, however, that if we make the extreme assumption of regarding every death associated with the puerperal state as due to maternal causes, the excess of the death rate unconnected with childbearing of the single over the married must then have increased from about 12 per cent. in 1911–20 to 31 in 1930–32 at ages 20–25, from 17 to 43 per cent. at 25–30, and from 26 to 41 per cent. at 30–35, so the explanation is not to be found here. There are as yet few signs to suggest that the development of the eugenic conscience has been operating upon selection for wedlock to such an increasing extent as to account for this, and it is difficult to escape the conclusion that in the present state of society the married condition *per se* for women is more favourable to vitality than the single condition at ages up to 60. Whether this is a matter of endocrine balance, psychology, economic and environmental differences, or all of these, cannot be decided, nor just what proportion of the handicap of the single women is due to these causes and what proportion to selection, but the plain fact that the risk of dying between ages 25 and 60 is smaller for the average married woman than the average single woman in the population, despite the risks attendant upon pregnancy and childbirth, is one which might usefully be stressed as a corrective to exaggerated fears of maternity.

CAUSES OF DEATH.

The causes of death of males and females at 18 groups of ages are stated in Table 21 for the whole country, and in Table 22 further detail of age is shown for all causes of significance at ages 0–5. In Table 23 deaths from each cause distinguished are tabulated by month of occurrence and by sex (but not by age). Table 23 differs from all others in referring to date of occurrence and not of registration. Table 21 includes the full International List of causes of death, as revised in 1929. The information as set out in this table is also available for London, and for the county borough, urban district and rural district aggregates of England and Wales. Certain of the numbered items in it are subdivided, and where this occurs the letters (*a*), (*b*), &c., indicate subdivisions in international use, and numbers (1), (2), &c., subdivisions made without international agreement. All other abstracts of the causes of death are arranged in the form of the short list of causes adopted by the Registrar-General in consultation with the Ministry of Health for use during 1931–40. The relation of this list to the detailed International List, as revised by the International Commission in 1929, is shown at the head of Table 24.

The contents of every heading in both the short and the detailed list now in use are defined in the Registrar-General's " Manual of

the International List of Causes of Death" (1929 Revision),* which should be consulted in all cases where it is desired to ascertain the precise significance of any heading in the lists.

Where two or more causes of death are jointly stated, the classification of the death to one or other of the causes in the International List is carried out in conformity with rules of selection, whose general principles are laid down in the Manual. Thus, with certain exceptions, deaths from violence associated with disease are classed to the appropriate violent cause, and deaths from an infectious disease associated with a local disorder such as a cardiac or renal lesion are classed to the infectious disease. Deaths are therefore not always classed to the immediate cause, but in some instances to a more remote one leading up to it. These rules for selection have not been seriously modified since 1901, so that continuity in the resulting tabulation has been maintained. Sufficient understanding and experience of the new form of certificate, introduced in 1927, has first to be gained before replacing the code of selective rules by the expressed opinion of the certifier. However desirable it may seem to make the change at once for certain combinations of causes, the importance of safeguarding the continuity of the statistics of causes of death must outweigh such considerations until the quality of certification is such as to justify reliance upon the order of statement for all combinations of causes. Special secondary tabulations according to the associated cause are made for deaths connected with anæsthetics, alcoholism and childbearing.

In Table 24 deaths are shown for the several geographical regions of the country, for urban and rural portions of administrative counties, and for county and metropolitan boroughs, arranged by sex, age, and the short list of causes as set out at the head of the Table. The same information, though not by age, is also available for each individual administrative area.

In addition to the above tables, which relate exclusively to the year 1933, Table 6 contains a statement of the number of deaths registered in each year 1923–33 from each cause distinguished in Table 21 so far as available, with distinction of sex but not of age; while Table 7 states the corresponding crude death-rates per million living for persons, males and females, so far as these can be regarded as of any significance, no rates being shown for causes which give a rate of less than five per million population. But the crude rates in Table 7 are liable to be misleading as indices of the progress of mortality even where their numerical basis is adequate. Owing to the rapid ageing of the population at the present time as a result of simultaneous fall in birth and death-rates the rates shown in Table 7 for causes mainly affecting old people tend automatically to increase, and thus to overstate mortality from such causes as cancer, cerebral hæmorrhage and heart disease. As this overstatement had become

* Copies may be obtained from H.M. Stationery Office. Price 3*s.* net.

seriously misleading in many cases, Table 8 was inserted to correct it by showing the course of mortality from each cause dealt with when allowance is made for such population changes by standardization (see page 1). Owing to the clerical labour involved in the preparation of these rates the list of causes in Table 8 is much shorter than that in Table 7, and rates are shown only for males and females separately. Standardized rates for both sexes jointly are given for a few causes in Table 9. Tables Nos. 11 and 12 state the mortality during the eleven years 1923–33 of infants under one year of age from the causes of chief importance at that age, but without distinction of sex.

1, 2. **Typhoid and Paratyphoid Fevers.**—The number of deaths classified to this heading during 1933 was 222. Of these, 39 were ascribed to paratyphoid infection, the same number as in 1932, forming 18 per cent. of the total compared with 19 per cent. in the preceding period of 5 years.

The standardized rates corresponding to these deaths, 5 per million persons living (Table 9), 6 for males and 4 for females (Table 8), are the lowest recorded.

Table 9 shows that this rate is quite trifling compared with those of earlier years, the rate for 1871–75, for instance, having been 371 per million, or over 70 times that for 1933.

The distribution of this mortality throughout the country is outlined in Table XXXV.

The highest mortality rate in 1933 for any region is that for Midland II. North II follows next, and Wales and London's outer ring show the lowest rates. Excess of mortality in the small towns had been the general rule during the preceding twenty years, but in 1933 the rural districts outside Greater London had a rate of 8 per million, the small towns 6, and county boroughs 4.

Prevalence (Table 26) in England was 4 per 100,000 living, the lowest rate recorded, but in the Administrative Counties of Wales the rate of 3 per 100,000 was slightly above the lowest rate of 1932. The fatality rate (Table XXXVI) was above the rates of the 3 preceding years. The distribution throughout the various regions in 1933 is also shown in Table XXXV.

Prevalence was highest in North I and Midland II and lowest in Wales I. Fatality was highest in Midland II. The proportion of paratyphoid to total notifications ranged from 19·0 in Wales to 27·0 in the Midlands, 28·6 in the South West, 32·3 in the East, 39·6 in the South East and 47·0 per cent. in the North.

The highest mortality rate recorded in Table 10 is, for counties of over 100,000 population, 103 per million in Northants and 35 in Yorks, East Riding. The county boroughs with highest rates are Northampton (83), Barrow-in-Furness (46), Eastbourne (35), Barnsley and St. Helens (28).

Table XXXV.—Typhoid and Paratyphoid Fevers; Mortality, Prevalence and Fatality at all ages. Measles and Whooping Cough; Mortality at ages under five years, and Proportion of Deaths occurring in the First One or Two Years of Life, 1933.

	Typhoid and Paratyphoid Fevers.			Measles.		Whooping Cough.	
	Deaths per million living.	Cases† per million living.	Deaths per 1,000 cases notified.	Deaths per 100,000 living at 0–5.	Deaths at 0–2 per cent. of those at all ages.	Deaths per 100,000 living at 0–5.	Deaths at 0–1 per cent. of those at all ages.
England and Wales	6	44	126	58	59	74	44
South-East	4	46	85	19	47	78	45
Greater London ..	4	46	85	19	52	88	42
Remainder of South-East ..	4	45	86	18	40	62	51
North	6	43	141	92	61	78	41
North I	8	89	90	106	57	59	49
,, II	9	43	200	39	62	74	47
,, III ..	5	28	173	45	55	78	36
,, IV ..	6	35	158	126	64	88	40
Midland	9	44	199	65	62	58	47
Midland I ..	5	32	145	65	59	55	47
,, II ..	17	69	247	65	70	63	48
East	6	53	113	24	43	69	40
South-West ..	5	42	128	28	51	66	55
Wales	2	25	63	104	57	91	50
Wales I	1	17	63	121	59	102	48
,, II	3	45	65	51	41	61	63
County boroughs* ..	4	32	140	112	63	79	41
Other urban districts*	6	43	146	51	56	64	49
Rural districts* ..	8	61	128	19	39	68	48
Greater London :—							
Admin. County ..	6	43	137	31	54	111	42
Outer Ring ..	2	50	39	7	43	66	42

* Excluding Greater London. † Including cases in Port Sanitary Districts.

6. **Small-pox.**—The deaths allocated to this cause numbered 2, a smaller number than in any of the preceding fourteen years. The mortality record for this disease is contained in Table 9, which shows that the standardized rate for 1933 was less than 0·5 per million, indicated by 0 in the table, as in sixteen other years since the 1901–05 epidemic. In the remaining eleven of these years the rate has been one per million.

Of the 2 deaths classed to small-pox, one was a male child of 2 years with acute miliary tuberculosis and smallpox, the other a male aged 52 years.

The type of disease prevalent in 1933, though not specified in the records, is indicated by the low fatality rate of 3·2 per 1,000 notified cases (Table XXXVI). Since 1923, when it suddenly fell from 27·7 to 2·8 per 1,000 cases, the rate has shown but slight fluctuations—between 4·3 in 1928 and 1·5 in 1932.

The notified cases numbered 631, compared with 2039 in 1932 and 5,664 in 1931, and of these 604 occurred in Greater London, 9 in the remainder of the South East, and 9 in Lancashire.

7. Measles.—The deaths registered from this cause numbered 1,937 corresponding to a mortality of 48 per million population. But allowance for decreased proportion of children in the present population increases the rate on standardization from 53 to 76

Table XXXVI.—Fatality of certain Infectious Diseases (Deaths per 1,000 Notified Cases), 1911–33.*

Year.	1. Enteric (typhoid and para-typhoid) fever.	6. Small-pox.	8. Scarlet fever.	10. Diphtheria.	15. Erysipelas.	16. Poliomyelitis (including polioencepha-litis).	17. Encephalitis lethargica.	18. Cerebro-spinal fever (meningo-coccal meningitis).
1911	174	78·0	18·1	103	39	?	?	?
1912	191	73·2	18·6	96	39	?	?	?
1913	182	87·0	16·1	88	35	283	?	1,089
1914	194	61·5	17·2	99	42	348	?	1,257
1915	199	141·3	18·6	107	46	331	?	630
1916	174	113·2	17·8	101	39	270	?	656
1917	205	333·3	15·3	100	43	469	?	663
1918	201	30·8	20·5	106	47	1,004	?	673
1919	147	77·6	14·7	90	42	297	533	727
1920	171	114·1	12·0	81	52	404	539	911
1921	158	15·9	9·5	72	55	314	493	1,007
1922	191	27·7	12·7	78	53	352	742	1,047
1923	140	2·8	11·6	68	50	185	517	934
1924	120	3·5	10·5	60	52	183	279	746
1925	139	1·7	10·8	58	57	370	520	876
1926	133	1·8	8·3	59	55	181	583	926
1927	103	3·2	6·8	52	56	203	713	911
1928	124	4·3	5·7	52	55	306	819	1,061
1929	133	3·6	6·0	55	58	263	999	882
1930	106	2·4	6·7	47	56	212	1,241	938
1931	110	1·6	6·6	53	66	247	1,471	650
1932	101	1·5	6·2	54	68	237	1,463	568
1933	126	3·2	5·6	56	66	253	1,887	556

* The rates in this table are given with reserve, being in some respects unsatisfactory. For the years 1911–13 cases of disease among non-civilians have been excluded from the notification returns, but it has not been possible to distinguish their deaths; for the years 1920–1925 inclusive both cases and deaths relate to civilians only; for all other years the figures relate to the total population.

The numbers relating to small-pox in some years are too small to yield significant rates, but their basis of fact can be ascertained from Tables 6 and 28, and the rates quoted serve to bring out the extremely mild type of disease prevalent in 1921–33. The rates for poliomyelitis include polioencephalitis, which was not distinguished in the notification returns until 1919. The extraordinary rise in 1918 is partly ascribable to certification of a number of deaths from the then "new disease," encephalitis lethargica, as polioencephalitis, but mainly to a reduction in notifications unaccompanied by significant change in the number of deaths (*see* Report for 1918). The rates from this disease will be found to differ from some of those published in the Annual Reports of the Chief Medical Officer of the Ministry of Health, partly because polioencephalitis is included throughout and partly because special inquiries made by the Ministry in certain years have led to revision of the returns for those years, which is not embodied in Table XXXVI. The cases there referred to are similar for each year dealt with, being in all cases derived from the published notification returns. The latter source of discrepancy applies also to cerebro-spinal fever, and in this case there is a possibility that some cases of posterior basal meningitis may not have been notified as cerebro-spinal fever though all such deaths are included in the table.

for males and from 44 to 71 for females, each of these rates being the lowest ever recorded. The death-rate for children under 15 years of age, 201 per million, is seen from Table 9 to be also a low record.

The distribution throughout the country of mortality from measles is stated in Table XXXV in the form of death-rates per 100,000 living at ages 0–5. Deaths at these ages in 1933 formed 88 per cent. of the total, and statement in this form prevents the comparison being prejudiced by varying proportions of children in the populations compared. Measles was not epidemic in London and produced the lowest death rate yet recorded in that County. The regions showing the highest rate were North IV and Wales I.

The Table also demonstrates to what an extent measles mortality is enhanced by urban conditions, the county borough rate of 112 being almost 6 times that in the rural districts, a similar gradation with urbanisation having been evident in each of the 23 years for which the facts are available. The proportion of deaths which occurred at ages under 2 years also increased from 39 per cent. in the rural districts to 63 per cent. in the county boroughs, and was higher in the North, Midlands, Wales I and Greater London than in the less urbanised areas.

The relations of measles and whooping cough mortality at ages under 5 to latitude and to overcrowding were referred to in the Review for 1932 (Table XXVII and Diagram 2).

Table 10 shows that, of administrative counties with over 100,000 population, Glamorgan returned the highest death rate, 112 per million or more than twice the rate for England and Wales, Denbigh 109, Caernarvon 84, and Stafford 81, coming next. The highest county borough rates were—Liverpool 351, South Shields 307 and Birkenhead 293.

8. **Scarlet Fever.**—Deaths registered from this cause numbered 729, smaller numbers having been recorded in each year 1926 to 1929 and in 1931 and 1932. The rate at ages under 15, 63 per million living, was also greater than in those six years and 1917.

The progress of the decline from the maximum decennial rate of 1861–70 (Table 9) may be traced in the following statement of proportionate figures for subsequent periods, taking the rate of 2,617 in that decade as 1,000—1871–80, 729; 1881–90, 345; 1891–1900, 168; 1901–10, 119; 1911–20, 54; 1921–30, 28; 1931, 17; 1932, 18; 1933, 24. Thus the mortality of 1933 was less than one fortieth of that experienced 60 years earlier. The records of individual years since 1881 indicate that, ignoring increases which were not maintained over at least two years, the downward trend has been interrupted by short periods of rising rates which have failed to compensate for the preceding fall. Such periods were 1888–90, 1891–93, 1898–1902, 1911–14, 1917–20, and 1928–30, and

it is noteworthy that several of these were coincident with similar periods of increase in the diphtheria death rate (1891–93, 1912–14, 1917–20, 1928–30). Prevalence increased by 51 per cent. in 1933 compared with the preceding year, whereas mortality increased by only 37 per cent.

Table XXXVI shows that the fatality ratio of deaths to notified cases was 5·6 in 1933 compared with a mean rate of 6·2 per 1,000 cases notified in the preceding five years. This rate is less than one-third of that at the commencement of the record in 1911, when the notifications were first tabulated, scarlet fever and small-pox showing much the greatest declines of fatality in the Table.

The distribution of the disease according to urbanisation and geographical location is given in Table XXXVII. Increased prevalence compared with 1932 is recorded in every region, the percentage increase in the notification rate ranging from 11 in the

Table XXXVII.—Scarlet Fever and Diphtheria, 1933 : Mortality at Ages under 15 Years, Prevalence and Fatality at All Ages.

—	Scarlet Fever.				Diphtheria.		
	Deaths per million living at 0–15.	Cases per 100,000 living at all ages.	Deaths per 1,000 cases notified.	Deaths at 0–5 per 100 at all ages.	Deaths per million living at 0–15.	Cases per 100,000 living at all ages.	Deaths per 1,000 cases notified.
England and Wales ..	63	321†	5·6	44	261	118†	56
South-East	62	358	4·7	38	253	125	47
Greater London ..	67	441	4·1	40	330	166	45
Remainder of South-East	53	230	6·6	34	134	61	54
North	90	384	6·6	51	352	140	64
North I	186	581	10·3	56	128	72	53
,, II	33	270	3·4	33	427	165	70
,, III	76	385	5·4	44	447	163	67
,, IV	68	335	5·6	52	380	147	64
Midland	35	213	5·4	43	124	73	47
Midland I	43	234	5·7	44	125	77	47
,, II	21	173	4·6	37	120	66	49
East	20	186	3·5	42	165	69	65
South-West	34	166	5·2	22	181	73	59
Wales	66	313	6·5	38	332	154	62
Wales I	72	381	6·0	40	334	155	62
,, II	49	126	10·3	33	324	153	59
County boroughs* ..	72	340	6·1	50	338	148	58
Other urban districts*	69	298	6·5	41	200	84	62
Rural districts* ..	38	193	6·2	42	156	64	67
Greater London :—							
Admin. County ..	75	512	3·8	42	386	225	37
Outer Ring ..	58	366	4·5	37	275	105	63

* Excluding Greater London. † Including Port Sanitary Districts.

South West to 91 in North I. In London there was a 57 per cent. increase in prevalence with a 9 per cent. fall in mortality. The death rate fell also in North II, Midland II, East and Wales I, but increased in the other regions.

The notification rate was greatest in North I, followed by Greater London, and lowest in Wales II, and showed the usual increase with urbanisation from 193 in the rural districts to 512 in London Administrative County. The fatality ratios were lowest in North II, East, and Greater London and highest in Wales II and North I. Outside London it was unaffected by urbanisation.

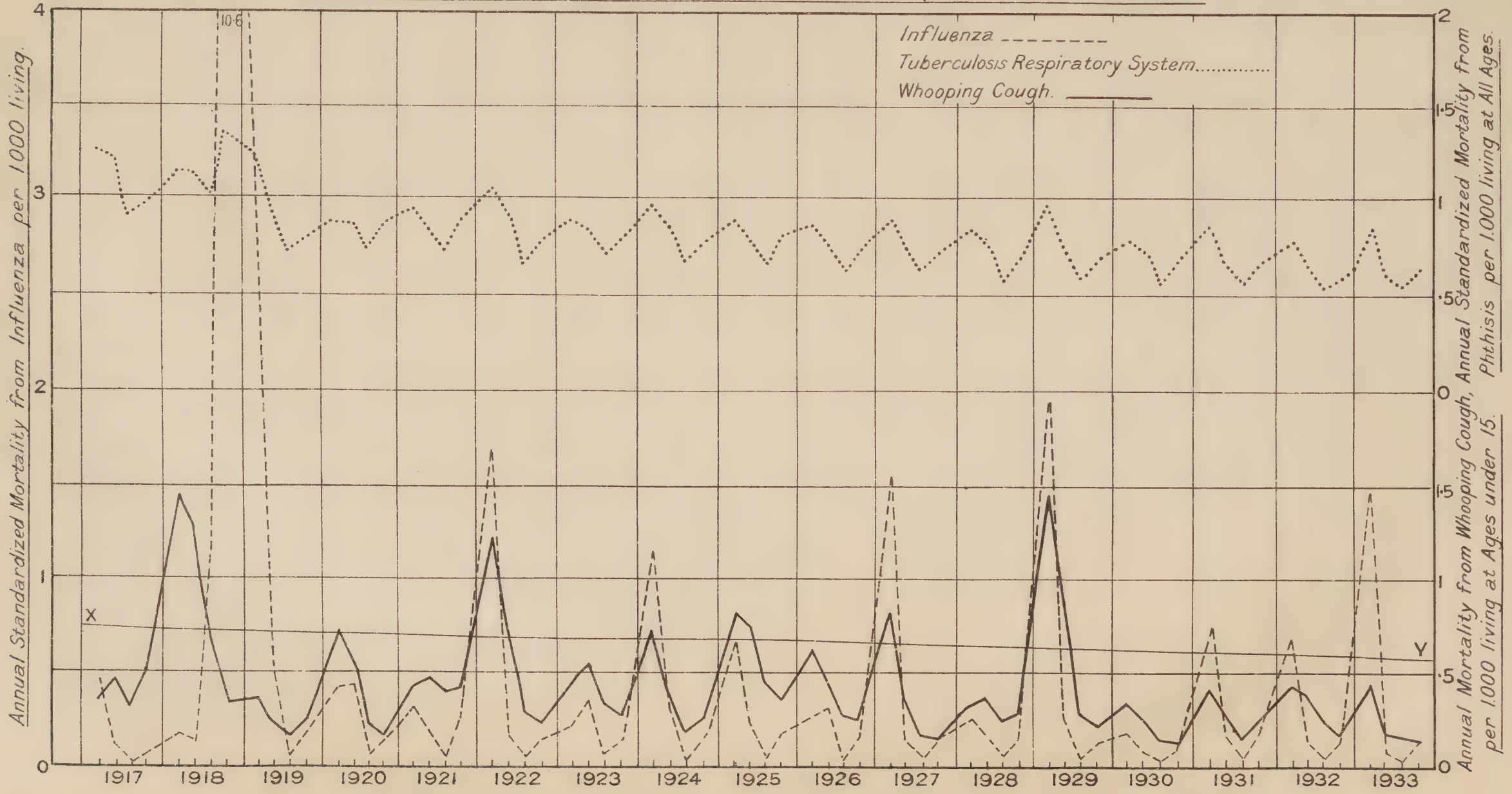
Children under 5 provided 44·2 per cent. of the deaths, compared with 45·7 in 1932 and 43·0 in 1931. The proportions in the six quinquennia from 1901–05, to 1926–30 were 60·6, 58·4, 54·0, 48·4, 48·6 and 42·4, this fall being partly due to alteration in the ratio of younger to older children in the population resulting from the declining birth rate. The rate of fall in mortality risk has been greater, however, for younger than for older children, the 1931–33 mortality rates at ages 0–5, 5–10, 10–15 and 15–20 being 1·9, 2·4, 3·6 and 5·9 per cent. respectively of the corresponding rates in 1861–70. The death-rates per million living at these four ages, tabulated below, show that this differential rate of decline in mortality risk was in progress from the beginning of the century up to 1926–30, the rate at 5–10 years being 68 per cent. of that at 0–5 years in the latter period, compared with 42 to 47 per cent. in the decades from 1861 to 1900. In 1931–33 this ratio has fallen again to 58 per cent., a slight increase in the mean death-rate having occurred at 0–5 years, and a decrease at 5–10 years.

	Death rates per million.				Per cent. of rate at 0–5 years.			
	0–	5–	10–	15–20.	0–	5–	10–	15–20.
1861–70 ..	4,644	2,193	504	153	100	47	11	3
1871–80 ..	3,504	1,522	326	104	100	43	9	3
1881–90 ..	1,667	763	154	42	100	46	9	3
1891–1900 ..	844	353	81	33	100	42	10	4
1901–10 ..	570	274	65	29	100	48	11	5
1911–20 ..	244	140	38	18	100	57	16	7
1921–25 ..	154	93	30	15	100	60	20	10
1926–30 ..	87	59	19	8	100	68	22	9
1931–33 ..	89	52	18	9	100	58	20	10

Table 10 shows that, amongst counties with over 100,000 population, mortality was highest in Durham (62 deaths per million) and Northumberland (46).

The highest rates amongst the county boroughs (average 20) are those of Sunderland (139) and Wakefield (133).

DIAGRAM 3. STANDARDIZED MORTALITY FROM INFLUENZA AND PHTHISIS, AND MORTALITY RATE FROM WHOOPING COUGH AT AGES UNDER 15 IN EACH QUARTER. 1917 - 1933.



9. **Whooping Cough.**—The deaths allocated to this heading numbered 2,270 (991 males and 1,279 females). The excess for females is shown by Table 6 to be a constant feature of this disease, and tends to increase with age. The percentage ratios of the numbers of female deaths to male deaths in 1933 are 114 at 0–3 months, 106 at 3–6 months, 113 at 6–12 months, and 122, 178 and 162 in the second, third and fourth years of life respectively, the ratios between the death rates being slightly higher owing to the excess of males at risk at these ages. An increasing female excess after 3–6 months, at which age the excess is scarcely appreciable when averaged over a period of years, has been a constant feature of the records of the last four decades.

The standardized death-rates, 76 for males and 100 for females (Table 8), are the lowest recorded except in 1930.

The death-rate per million living at ages under 15 reached a maximum of 1,511 for the five years 1866–70, after which, with a single exception, the quinquennial rates progressively declined to 387 in 1926–30. In 1933 the rate was 237 (Table 9.).

The annual rate of mortality from whooping cough per 1,000 living under 15 estimated for each quarter in the years 1917 to 1933 is represented in Diagram 3, where the standardized death-rate from influenza is also graphically shown for the same quarters. In every year except 1917, 1921, 1923 and 1928 whooping cough mortality was maximal in the first quarter, and the mean secular trend of the March quarter rates is indicated by the straight line XY drawn through ordinates equal to the mean rate for the first 7 years (709) at 1920 and for the last 7 years (597) at 1930.

The March quarters when influenza was strongly epidemic, with a standardized death-rate exceeding 1 per 1,000 living, were those of 1919, 1922, 1924, 1927, 1929, 1933, and in 4 of these quarters whooping cough mortality surpassed the level of expectation XY. A study of the two graphs leaves little doubt that, apart from the similarities arising from the seasonal periodicity common to most infectious diseases, there is a relationship between the amounts of registered mortality from the two diseases occurring in the same quarters, and this is demonstrated more conclusively in the section on Winter Mortality in relation to Mean Air Temperature and Influenza Rate (*see* Diagram 7). The coincidence in the years of high mortality may be due to the presence of some factor affecting both influenza and whooping cough, but it seems more probable that the rise in whooping cough deaths, particularly noticeable in the March quarters of 1922 and 1929, was due to the epidemic transmission of respiratory infections secondary to influenza proving especially fatal to children already suffering from whooping cough.

The latter hypothesis receives support from the fact that the 1933 influenza epidemic, which was remarkable for the absence of any appreciable contemporaneous increase in mortality from bronchitis and pneumonia not attributed to influenza, was also not accompanied by increased whooping cough mortality.

There is no reason to suppose that whooping cough prevalence is affected by an influenza wave, and if only its fatality is affected little impression would be made upon the number of whooping cough deaths unless prevalence of both diseases happened to be high at the same time.

When whooping cough and influenza are mentioned jointly on a death certificate, precedence is usually given for purposes of statistical classification to the former, and the Table below shows the numbers of deaths assigned to whooping cough in each quarter during 1929 to 1933 with mention of influenza as an associated or secondary cause, and the proportions of these per 1,000 total deaths so assigned.

	Numbers of deaths.				Per 1,000 whooping cough deaths.			
Quarter ..	1st	2nd	3rd	4th	1st	2nd	3rd	4th
1929	66	3	—	1	19	2	—	2
1930	—	1	—	—	—	2	—	—
1931	7	1	—	—	7	2	—	—
1932	7	1	—	1	7	1	—	2
1933	24	1	1	—	22	2	3	—

The increase in whooping cough deaths due to a recognised double infection amounted to only 1·9 per cent. in the March quarter of 1929, which is scarcely appreciable compared with the total increase indicated in Diagram 3.

The distribution of mortality at ages under 5 and the proportion of deaths under 1 year of age are given in Table XXXV. The county borough rate of 79 was the lowest ever recorded and the increase of mortality with urbanisation was less evident than usual, although mortality in London was much higher than in the Outer Ring. The average rates of the 5 years 1926–30 and the annual rates since 1931 at ages under 5 are :—

	London.	County boroughs.	Urban districts.	Rural districts.
1926–30 ..	130	133	106	90
1931 ..	99	105	71	52
1932 ..	116	121	88	72
1933 ..	111	79	64	68

Wales I and North IV registered the highest mortality and Midland I and North I the lowest.

Wales II showed the highest proportion of deaths at ages under 1 year as in 1932.

10. **Diphtheria.**—The 2,646 deaths in 1933 include 1,291 males and 1,355 females. A female excess is shown also by the standardized death-rates (Table 8), as in each year since 1919 except 1922 and 1931, though the crude death-rate (Table 7) is generally higher for males. For 1933 the crude rates were 67 per million for males and 65 for females, and the standardized rates 88 for males and 92 for females.

The history of diphtheria mortality is best expressed by the death-rate from diphtheria and croup at ages under 15 in Table 9, for during last century much diphtheria was evidently returned as croup, and the larger proportional child population in itself tended to produce a higher crude death-rate at all ages. In 1861–65 this rate was 1,422 per million, but fell to 891 in the next quinquennium, and the 5-yearly rates then showed only slight fluctuations until the end of the century. The downward trend of annual rates since 1900 has been interrupted by short periods of increase. These occurred in 1912–14, 1917–20, 1924–26 and 1927–30, a contingent rise in scarlet-fever mortality occurring in three of these periods. The rate in 1933, 261 per million living under 15, is above that of the two preceding years. (Table 9.)

Table XXXVII shows that diphtheria mortality was highest in North III, followed by North II, and lowest in the Midlands and North I. For the country as a whole, outside London, the rate increased regularly with urbanization, and the London rate was also in excess of that for London's Outer Ring. It seems probable that diphtheria is still much more freely returned in some sections of the population than in others. Thus the frequency of its notification has been greater in London than in any of the regions or density aggregates separated in this table or its predecessors in each of the years 1916–33, with the exception of 1931 when the London rate was exceeded in Wales II.

The contrast between North I and the other Northern regions has been evident in each of the years 1931 to 1934 as shown below, and it is seen from these figures and from Table XXXVIII that

	Notifications per 100,000 living.				Deaths per million living at ages 0–15.			Deaths per 1,000 notified.		
	1931.	1932.	1933.	1934.	1931.	1932.	1933.	1931.	1932.	1933.
North I ..	64	51	72	160	136	67	128	62	41	53
North II..	142	163	165	196	409	488	427	77	79	70
North III	119	131	163	276	371	330	447	79	64	67
North IV	141	147	147	196	372	379	380	66	64	64

North I has also been characterised in recent years by a low diphtheria fatality in comparison with the rest of the north of England.

Recent bacteriological research suggests that under present conditions the fatality rate of an outbreak of diphtheria is largely dependent upon the proportion of cases infected by particular strains of C. diphtheriæ which may have a localised distribution. Table XXXVIII has therefore been introduced to show the trend, over a series of years, of prevalence and fatality indices in London, each county borough having a population exceeding 150,000 in 1931, and in the residue of each region surrounding these towns. Although local differences in the standard of notification of diphtheria may affect comparison of local rates in a given year, this factor is not likely to affect comparisons of the trend of prevalence or fatality in one town with the corresponding trend during the same period in another town. The rates for 1934 which have become available at the time of going to press have been included in the Table. There are wide differences, both as regards prevalence and fatality, between towns of similar size and situation, such as Manchester and Liverpool, or Leeds and Sheffield.

Fatality ratios exceeding 100 deaths per 1,000 notified cases were registered in 5 of the county boroughs distinguished in Table XXXVIII in 1926, these being Croydon, Bolton, Leicester, Nottingham and Plymouth; in 1927 this level was only reached in 3 (Sunderland, Bradford, Coventry), in 1928 in 2 (Bolton, Coventry), and in 1929 in 2 (Bolton, Bradford). In 1930 and 1931 Birkenhead and in 1933 West Ham alone gave ratios in excess of 100, and in 1934 Bolton and the region of North II excluding Kingston-upon-Hull. The distributions given below of the fatality ratios for the 36 areas distinguished in the table fail to show evidence of a bimodal character since 1930, although in 1926-29 the occurrence in some of the towns of outbreaks with fatality above the usual range seems to be indicated, the distributions in 1927 and 1928 being particularly abnormal.

	Fatality ratio.									
	0–	20–	40–	60–	80–	100–	120–	140–	160–	All.
1926 ..	1	2	12	8	8	4	1	—	—	36
1927 ..	—	7	10	16	—	2	1	—	—	36
1928 ..	2	9	11	12	—	—	—	1	1	36
1929 ..	—	5	14	13	2	1	1	—	—	36
1930 ..	1	11	18	4	1	1	—	—	—	36
1931 ..	2	8	14	6	5	1	—	—	—	36
1932 ..	3	9	11	10	3	—	—	—	—	36
1933 ..	—	11	11	9	4	1	—	—	—	36
1934 ..	—	8	11	13	2	2	—	—	—	36

In Table XXXIX all the county boroughs have been grouped according to their geographical situation by latitude and the per-

Table XXXVIII.—Diphtheria prevalence and fatality rates in Certain Large Towns and Regions, 1926 to 1934.

		Notified Cases per 100,000 living.									Deaths per 1,000 Notified Cases.								
		1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.
England and Wales		131	133	155	159	184	126	108	118	170	59	52	52	55	47	53	54	56	59
South East :	London Admin. County	296	271	275	268	303	195	188	225	281	40	32	33	30	34	31	38	37	40
	Croydon C.B.	155	122	223	194	169	90	48	91	181	103	39	66	53	39	(24)	96	78	57
	Portsmouth C.B.	407	310	360	317	255	151	97	77	136	70	65	61	33	27	35	(8)	(46)	86
	Southampton C.B.	204	150	194	214	232	122	119	161	419	58	39	58	68	69	60	(9)	(31)	28
	West Ham C.B.	221	302	342	265	282	120	105	182	291	19	42	32	48	40	31	40	105	61
	Remander of South East	113	124	161	156	168	102	65	74	124	53	52	57	59	47	50	51	56	59
North I :—	Newcastle-on-Tyne C.B.	73	78	96	95	78	42	55	33	137	82	67	(30)	48	(18)	(51)	(32)	(96)	61
	Sunderland C.B.	49	72	104	79	144	90	61	39	82	(88)	128	(11)	(62)	49	65	(44)	(41)	78
	Remainder of North I	61	84	132	121	119	65	49	81	172	87	79	62	63	56	63	42	51	69
North II :—	Kingston-upon-Hull C.B.	250	253	225	279	280	361	534	473	333	24	43	31	44	54	82	78	60	60
	Remainder of North II	72	74	82	64	80	69	42	63	151	88	58	42	75	62	69	83	96	109
North III :—	Bradford C.B.	114	116	97	139	117	82	106	129	288	58	103	68	122	55	(36)	45	39	52
	Leeds C.B.	79	91	133	110	207	203	183	216	455	69	64	33	47	54	88	54	83	70
	Sheffield C.B.	201	164	159	146	134	80	79	189	272	52	38	40	45	29	(14)	(15)	20	30
	Remainder of North III	68	74	98	99	116	115	136	150	234	84	73	65	68	71	90	75	78	79
North IV :—	Birkenhead C.B.	87	105	90	67	167	152	172	241	472	(51)	(48)	(42)	(29)	103	102	39	41	38
	Bolton C.B.	66	79	61	40	45	25	24	60	54	121	71	153	(110)	(37)	(45)	(71)	(56)	116
	Liverpool C.B.	175	191	218	267	462	375	384	340	338	72	52	52	58	59	59	56	60	61
	Manchester C.B.	153	175	158	120	137	95	140	134	169	88	69	79	63	55	82	76	85	65
	Salford C.B.	215	204	173	288	317	257	329	350	414	38	46	24	56	41	53	30	30	30
	Remainder of North IV	85	97	99	113	124	98	91	96	155	75	63	68	67	63	68	77	69	74
Midland I :—	Birmingham C.B.	247	211	218	238	235	178	117	83	156	50	31	33	36	37	35	30	38	53
	Bristol C.B.	186	169	153	289	369	207	134	157	182	62	49	28	57	27	37	41	34	23
	Coventry C.B.	74	144	162	265	293	114	64	81	108	(53)	113	168	88	85	57	(27)	74	65
	Stoke-on-Trent C.B.	93	83	111	97	91	75	59	85	104	90	48	(19)	40	39	81	(31)	(30)	(21)
	Remainder of Midland I	100	95	112	126	148	101	64	61	116	80	78	71	61	49	57	62	55	63
Midland II :—	Leicester C.B.	152	127	188	104	83	47	32	140	192	106	35	41	51	(30)	(53)	(92)	38	43
	Nottingham C.B.	238	355	346	259	255	99	51	56	76	108	66	47	83	50	(15)	(66)	(38)	(28)
	Remainder of Midland II	95	94	115	116	155	80	59	58	72	67	70	65	74	50	58	65	54	56
East		53	61	133	126	107	86	78	69	66	52	65	51	64	59	67	64	65	72
South West :—	Plymouth C.B.	152	197	217	264	318	191	212	165	186	116	62	76	48	37	46	45	53	45
	Remainder of South West	47	46	81	113	159	82	66	63	70	49	63	59	69	56	51	52	61	55
Wales I :—	Cardiff C.B.	108	179	248	328	321	264	221	215	235	66	37	28	41	40	41	20	40	40
	Swansea C.B.	151	122	239	266	290	289	190	172	200	57	70	41	39	23	23	(29)	(32)	(24)
	Remainder of Wales I	142	123	163	179	238	163	136	144	215	66	64	70	71	52	57	62	72	82
Wales II		82	115	93	107	234	229	165	153	165	57	48	74	70	54	51	56	59	57

NOTE.—In London, notifications are transferred to the area of residence, but this is not the case in other towns.

NOTE.—Rates in parentheses are founded upon less than 10 deaths.

centage of their populations living at densities exceeding 2 per room in 1931, and the diphtheria mortality at ages under 15 during 1929–33 has been calculated for each group. Mortality bears no

Table XXXIX.—Mortality from Diphtheria under 15 years of age, 1929-33, in the County Boroughs distributed according to Latitude and Rate of Overcrowding, per cent. of that in all County Boroughs.

Per cent. at density exceeding 2 per room.	Degrees of North Latitude.				
	50°–	51°–	52°–	53°–	54°–
0–	76	47	75	95	—
3–	77	86	102	82	—
6–	—	161	66	124	30
9–	121	103	29	143	67
18 and up	—	—	—	—	39
All densities	86	101	77	124	46

consistent relation to the latitude in which the town is situated, the most remarkable feature being the low mortality in the group of 10 most northerly towns, despite their unfavourable rates of overcrowding. The Lancashire and Yorkshire towns, which comprise most of the group in latitude zone 53–54°, exhibit a rise of mortality with increasing overcrowding index, and this is also evident for the Southern towns, but not for the Midland zone (52–53°).

Table 10 shows that the counties, with over 100,000 population, with highest mortality in 1933 were Denbighshire (134 per million), also highest in 1930, 1931 and 1932, Flintshire (132) and Mon-

Table XL.—Influenza Mortality per million Population during the first 3 and last 9 months of each Year, 1921–33.

	January–March.	April–December.
1921	356	198
1922	1,854	133
1923	240	214
1924	1,322	213
1925	783	175
1926	298	206
1927	1,827	147
1928	332	152
1929	2,450	173
1930	225	94
1931	958	165
1932	926	131
1933	1,995	100

mouthshire (117). The highest rates among county boroughs (average 88) were those for Huddersfield (430), Dewsbury (336) and Wakefield (316).

11. **Influenza.**—The deaths assigned to this cause numbered 22,890, 10,926 of males and 11,964 of females. The resultant crude mortality rate of 567 per million is reduced on standardization, by allowance for the increased age of the population, to 432 (Table 9), 463 for males and 401 for females (Table 8). Since the pandemic of 1918–19 this standardized rate has been exceeded in 3 out of the 13 years.

Mortality in the March quarter of 1933 was exceptionally high, the crude rate, as shown in Table XL, having been exceeded since 1919 only in 1929, and the standardized rate (Diagram 3) only in 1922, 1927 and 1929. As Table XL indicates, mortality in the latter nine months of the year has been subject to much slighter annual fluctuation than that in the first quarter.

The distribution of influenza mortality throughout the country is indicated in Table XLI.

Table XLI.—Influenza; Mortality. Encephalitis Lethargica and Cerebro-spinal Fever; Mortality, Prevalence and Fatality, 1933.

	Influenza.	Encephalitis Lethargica.			Cerebro-spinal Fever.		
	Deaths per Million Living.	Deaths per Million Living.	Cases per Million Living.	Deaths per 100 Cases Notified	Deaths per Million Living.	Cases per Million Living.	Deaths per 100 Cases Notified
England and Wales..	567	20	11†	189	23	42†	56
South-East	491	14	8	177	17	31	55
Greater London ..	465	12	7	182	20	36	55
Remainder of South-East	533	16	9	172	13	23	54
North..	610	27	12	227	36	68	53
North I	477	27	9	305	58	99	59
„ II	626	21	17	123	25	46	54
„ III	608	19	5	388	48	107	45
„ IV	657	32	16	206	24	40	59
Midland	569	20	10	195	22	37	59
Midland I	582	21	13	160	19	26	71
„ II ..	544	19	5	354	28	57	49
East	665	33	19	171	11	17	66
South-West	592	16	15	110	10	16	61
Wales..	661	16	12	129	15	18	87
Wales I	662	15	11	145	14	20	71
„ II	657	16	16	100	17	10	171
County boroughs* ..	585	23	13	178	31	56	55
Other urban districts*	595	22	11	203	21	38	55
Rural districts* ..	607	22	11	196	18	31	58
Greater London { Admin. Co.	520	12	5	230	27	53	51
Greater London { Outer Ring	406	12	8	148	13	19	67

* Excluding Greater London. † Including Port Sanitary Districts.

The highest regional rate is that for the East, followed by Wales and North IV, while the lowest rates are those recorded for Greater London and North I. Mortality generally was highest in the rural districts, decreasing slightly with urbanisation though the rate in London Administrative County was higher than in the Outer Ring.

In these respects the mortality from influenza contrasts with the incidence of the infantile epidemic diseases which follow an almost constant rule of increase with urbanisation. In 17 of the 23 years, 1911–33, for which comparison is possible, the highest mortality from influenza has been recorded in the rural districts.

The relation between influenza mortality of adults in mid-life and average density of persons per room in different classes of area is analysed in Table XLII, where the rates at ages 25–45 and 45–65 during the quinquennium 1929–33 have been calculated for aggregates of areas grouped according to these factors. London mortality attributed to influenza tends to be no greater in the Metropolitan Boroughs with high densities per room than in those with more satisfactory housing indices, but the county boroughs manifest a very definite increase in death-rate with increasing average density per room. It must be remembered that, as pointed out in the Reviews for 1931 and 1932, this grouping of the county boroughs

Table XLII.—Mortality from Influenza 1929-33 at ages 25-45 and 45-65 of Males and Females in different Classes of Area, when County Aggregates, County Boroughs and Metropolitan Boroughs are grouped according to the Mean Density of Persons per room in 1931.

Sex and Age.	Area.	Mean persons per room.								Mean persons per room.							
		·55–	·70–	·85–	1·00–	1·15–	1·30–	1·45–	All densities	·55–	·70–	·85–	1·00–	1·15–	1·30–	1·45–	All densities
		Rates per 100,000 living.								Mortality per cent. of that in England and Wales.							
Males 25–45	London	—	14	18	19	19	18	21	17	—	61	78	83	83	78	91	74
	County Boroughs	20	22	26	31	35	—	—	25	87	96	113	135	152	—	—	109
	Other Urban Districts	21	22	27	22	—	—	—	23	91	96	117	96	—	—	—	100
	Rural Districts	15	22	22	—	28	—	—	21	65	96	96	—	122	—	—	91
	All Areas	18	22	25	25	27	18	21	23	78	96	109	109	117	78	91	100
Females 25–45	London	—	14	13	14	12	12	10	13	—	82	76	82	71	71	59	76
	County Boroughs	13	17	18	22	27	—	—	18	76	100	106	129	159	—	—	106
	Other Urban Districts	14	17	22	17	—	—	—	17	82	100	129	100	—	—	—	100
	Rural Districts	17	18	20	—	20	—	—	18	100	106	118	—	118	—	—	106
	All Areas	15	17	18	18	20	12	10	17	88	100	106	106	118	71	59	100
Males 45–65	London	—	61	60	73	66	69	48	64	—	91	90	109	99	103	72	96
	County Boroughs	61	72	74	87	74	—	—	74	91	107	110	130	110	—	—	110
	Other Urban Districts	54	65	78	57	—	—	—	66	81	97	116	85	—	—	—	99
	Rural Districts	57	59	61	—	53	—	—	58	85	88	91	—	79	—	—	87
	All Areas	57	65	73	75	64	69	48	67	85	97	109	112	96	103	72	100
Females 45–65	London	—	49	46	42	47	48	65	47	—	100	94	86	96	98	133	96
	County Boroughs	41	50	57	62	53	—	—	54	84	102	116	127	108	—	—	110
	Other Urban Districts	43	45	60	47	—	—	—	47	88	92	122	96	—	—	—	96
	Rural Districts	45	46	43	—	50	—	—	46	92	94	88	—	102	—	—	94
	All Areas	43	47	55	52	50	48	65	49	88	96	112	106	102	98	133	100

according to density is closely correlated with northerliness of situation. The group with densities ·85—·99 persons per room consists in the main of the Lancashire and Yorkshire industrial towns, and the most densely housed group consists entirely of Tyneside towns. The factors unfavourable to respiratory diseases which accompany industrialisation, such as smoke, fog and reduced effective solar radiation, are therefore involved, as well as the greater crowding and lower average winter temperature. The combined effect of these on influenza mortality is evidently greater at ages 25–45 than at 45–65.

In the small towns, apart from the higher rates in the ·85—·99 per room zone, there is little evidence of association with housing density, whilst in the rural districts there is an increase in mortality with density at ages 25–45 for each sex, but little or no evidence of this at 45–65.

The proportion of deaths from influenza with stated respiratory complications (mostly pneumonia) was higher in 1933 than in any year since 1918–19 with the exception of 1929, in spite of the fact that the standardized mortalities assigned to bronchitis and pneumonia (without mention of influenza) were exceptionally low in 1933. The "sympathetic" increase during influenza epidemics of mortality attributed to respiratory and cardiac disease and other causes, without mention of influenza, is dealt with in a special section of this Review. (*See* pp. 94, 139, 140 and Diagrams 3 and 7). Table XLIII affords the means of comparing the varying proportions of deaths with respiratory complications in the several classes of area. It will be seen that the proportion is lowest in the rural areas and increases with urbanisation to a maximum in London.

Table XLIII.—Deaths from Influenza with stated Respiratory Complications (11*a*) per cent. of all Deaths from Influenza (11).

	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.
Oct. 1918–Mar. 1919	80	85	81	79	78
1926	61	70	67	58	55
1927	69	79	73	69	64
1928	64	71	68	62	58
1929	75	84	78	73	68
1930	63	73	67	60	57
1931	69	76	74	67	64
1932	68	77	70	67	63
1933	74	81	78	72	68

When influenza is jointly stated as a cause of death with certain other epidemic diseases, cancer, puerperal sepsis, acute abdominal crises, violent causes, and in most circumstances with tuberculosis,

venereal and post-venereal diseases, rheumatic fever and a few other causes, the death is classified as a rule to the cause other than influenza. That is to say influenza when associated with any of these causes is regarded for statistical purposes as having merely hastened or contributed to the fatal termination. Table XLIV gives the numbers of deaths assigned to the principal causes thus taking precedence over influenza in classification which were certified during 1929–33 with statement of influenza as an associated cause, and the per mille ratios of these numbers to all deaths classed to the causes in question. In 1933 there were 637 such deaths additional to the 12,890 deaths classed to influenza itself, that is, an addition of about 5 per cent., the corresponding additions in 1929 being 3 per cent. and in 1930–32 2 per cent.

Table XLIV.—Number and proportion of Deaths from certain causes with mention of Influenza as Associated Cause. 1929-33.

List. No.	——	No. of deaths with mention of associated influenza.					Per 1,000 deaths classed to the cause in question.		
		1929.	1930.	1931.	1932.	1933.	1929.	1930–32.	1933.
7	Measles	15	—	7	2	3	4	1	2
8	Scarlet fever	5	—	2	2	9	7	2	12
9	Whooping cough ..	70	1	8	3	26	11	2	11
10	Diphtheria	8	—	6	2	6	2	1	2
16	Acute poliomyelitis and polioencephalitis ..	3	—	2	1	1	21	7	5
17	Encephalitis lethargica	19	6	18	24	24	18	18	29
34	Syphilis (acquired) ..	7	2	6	—	3	5	2	2
80	Tabes dorsalis	12	1	5	7	6	14	6	8
83	General paralysis of insane	10	1	5	8	9	8	4	9
23	Tuberculosis of Respiratory System ..	372	53	192	117	365	12	4	13
24–32	Other forms of tuberculosis	27	7	19	9	12	4	2	2
45–53	Cancer	151	17	83	64	121	3	1	2
159	Premature birth ..	12	4	9	9	11	1	1	1
140 & 145	Puerperal or post abortive sepsis	5	—	—	5	8	4	2	8
163–171	Suicide	12	3	5	4	5	2	1	1
176–194	Accidental causes ..	6	3	6	4	4	0	0	0
Total classed to causes other than influenza		770	105	391	277	637			
No. classed to influenza ..		29,084	5,019	14,409	13,156	12,890			

The causes showing the greatest tendency to have influenza mentioned as an associated cause (the frequency of such mention exceeding 1 per cent.) were in 1929 acute poliomyelitis, encephalitis lethargica, tabes dorsalis, phthisis and whooping cough, in 1930–32 encephalitis lethargica, and in 1933 encephalitis lethargica, phthisis, scarlet fever, and whooping cough. Since the great bulk of the influenza prevalence in epidemic years is concentrated in the 3 months of the epidemic, the ratios *during the epidemic* would be several times the rates given in the table; thus in March quarters of 1929 and 1933 when influenza was epidemic, 5 and 7 per cent. respectively of the deaths certified as due solely or partially to

encephalitis lethargica had mention of influenza as an associated cause. On the other hand less than 1 per cent. of cancer deaths occurring during the epidemics of 1929 and 1933 had mention of influenza as associated cause, and in the statistics of the complete years the transfer of all such deaths from the cancer to the influenza heading would only reduce the cancer rate by about 1 in 500.

Tuberculosis deaths during 1929 and 1933 included 10 and 11 per 1,000 respectively with mention of associated influenza, but if the inquiry is confined to the March quarters, which were the epidemic periods of those years, the proportions were 24 and 31 per 1,000 respectively. In the 1918–19 pandemic the proportion during the December quarter of 1918 was 126 per 1,000. The effect of influenza in hastening death of persons suffering from phthisis is reflected during epidemics not only in these deaths with joint statement of cause but also in an increase above expectation of phthisis deaths without mention of influenza (*see* p. 140).

15. **Erysipelas.**—Deaths attributed to erysipelas numbered 1,191, 624 of males and 567 of females, corresponding to standardized death-rates of 30 for males and 25 per million for females. These rates attained their lowest level in 1923, 15 and 14 respectively, but in recent years mortality has increased (Table 8). It may be noted that a similar course has been followed by the standardized rates for carbuncle and boil (No. 151), which were higher in 1933 than in any of the preceding 15 years, having increased since 1924. The rates for diseases of the ear and mastoid, fatal cases of which are almost entirely infective, have also risen from 35 for males and 26 for females in 1924 to 50 and 38 respectively in 1933.

At ages under 5 the erysipelas death-rate per 100,000 living was 9 in 1896–1900, 8 in 1901–5, 6 in 1906–10, 4 in 1915–20, and 3 in 1923, but has risen again to 10 in 1933. In infants under 1 year the rate per 100,000 births fell from 33 in 1896–1900 to 11 in 1923, and has risen to 26 in 1932 and 40 in 1933. At ages 5–25 there has been no increase since 1923, the rates being only 4 per million, whilst at ages over 25 standardized mortality has increased from 22 to 34 per million for males and from 18 to 25 for females.

The notification rate, which rose from 32 per 100,000 in 1923 to 45 in 1929 and 1930 and then declined, again reached 45 in 1933 (Table 26). In London this rate reached 65, the highest since 1919.

16. **Acute Poliomyelitis.**—The increase in mortality and prevalence of this disease noticed in 1932 continued in 1933. Deaths, including those from acute polioencephalitis, numbered 202, compared with 178 in the preceding year. The standardized death-rate of 8 for males equalled the peak level reached in 1926, but for females the rate remained at 5 per million. The cases notified, numbering 714 of poliomyelitis and 83 of polioencephalitis,

were in excess of those in the five preceding years (Table 28). The seasonal distribution of these cases conformed to the usual type, prevalence being highest from August to October (Table 27).

17. **Encephalitis Lethargica.**—Deaths attributed to this disease numbered 815, 428 of males and 387 of females, yielding standardized death-rates of 19 per million for males and 16 for females. These are the lowest rates since 1923 (Table 8). The 432 notifications (Table 28) show a decline for the ninth year in succession, and are considerably less than deaths, yielding a fatality ratio of 1,887 deaths per 1,000 notifications, compared with 1463 in 1932. This ratio was 279 in 1924, and then rose in each successive year to 1,471 in 1931.

Table XLI shows that mortality was highest in the East and North IV, whereas in London mortality and more especially prevalence were, as usual, below the general average.

18. **Cerebro-spinal Fever** (*Meningococcal Meningitis*).—Deaths from this cause numbered 942. Of these 530 were of males and 412 of females, corresponding to standardized rates of 35·2 and 27·3 per million. These rates show a further decline from the high rates reached in 1931, the fall continuing at each age distinguished in Table XLV. At ages under 5 the rates were still in excess of those attained in the 1915–17 epidemic by 17 per cent. for males and 41 per cent. for females.

Table XLV.—Cerebro-spinal Fever, 1911–33: Mortality at Various Ages per Million Living and per cent. of that in 1915–17.

Year.	Males.					Females.				
	All Ages.*	0–5	5–15	15–25	25 and up*	All Ages*	0–5	5–15	15–25	25 and up*
	Mortality rate per million.									
1915–17†	69·8	148·2	45·3	135·3	35·2	31·6	122·7	36·5	24·8	10·5
1931	54·7	218·7	51·2	54·1	17·5	37·2	172·6	45·8	17·4	9·3
1932	46·4	209·6	36·0	42·6	13·6	31·8	153·0	31·5	16·3	9·5
1933	35·2	172·9	26·7	28·5	8·8	27·3	139·5	27·6	12·9	6·4
	Mortality rate per cent. of that in 1915·17.†									
1911–14†	17	43	26	4	5	31	45	24	16	14
1915–17†	100	100	100	100	100	100	100	100	100	100
1918	55	57	54	59	48	55	56	63	49	46
1919	39	64	49	28	24	51	56	52	46	39
1920	27	60	47	10	9	46	56	39	51	25
1921	21	52	28	5	11	36	50	28	28	21
1922	18	44	25	7	5	32	49	23	20	9
1923	13	31	19	3	6	27	32	27	29	11
1924	15	34	21	6	6	24	31	21	16	15
1925	18	44	29	6	4	29	39	26	19	14
1926	19	50	27	5	5	30	45	14	24	19
1927	24	63	30	6	8	34	44	37	19	18
1928	23	60	28	6	10	39	54	30	27	22
1929	33	83	38	14	11	50	71	45	27	18
1930	34	76	52	13	15	58	86	46	25	27
1931	78	148	113	40	50	118	141	125	70	89
1932	66	141	79	31	39	101	125	86	66	90
1933	50	117	59	21	25	86	114	76	52	61

* Standardized. † The rates used for 1911–14 and 1915–17 are mean annual rates for those years.

Notifications in 1933 numbered 1,695 (Table 28), this having been exceeded only in 1915, 1917, 1931 and 1932. The numbers in the preceding 5 years were 413, 667, 674, 2,216, 2136. The fatality ratio, 56 per 100 cases, is similar to that in 1932 (57) but is below that in recent years, the ratios in the 5 years preceding 1932 being 91, 106, 88, 94 and 65. In times of high prevalence, when attention is directed to the disease, notification statistics probably furnish a more complete record of the total number of persons attacked than at other times.

Prevalence was greatest from mid-January to the middle of March (Table 27), mortality being highest in February (Table 23).

The mortality distribution manifested, as in 1932, a higher rate in the towns than the rural districts, and in London than in the Outer Ring. TableXLI also shows that, as in the two preceding years, both mortality and prevalence increased in general from South to North, mortality being highest in North I, followed by North III and Midland II as in 1932, and lowest in the South-West and East. The fatality ratio of deaths to notified cases was in general lowest in the regions with greatest prevalence, and highest where the disease was least prevalent, which again suggests that notification is more complete during local epidemics.

Table XLVI indicates that during the quinquennium 1929–33 cerebro-spinal fever mortality amongst children under 15 years of age was greatest in the large towns north of latitude 53°, which corresponds roughly with the North region. When the towns of the northern zones are grouped according to their average density of persons per room, mortality increases with density of housing, and a similar association is evident for the southern towns, but not in the midland zone.

Table XLVI.—Mortality from Cerebro-spinal Fever under 15 years of age, 1929-33, in the County Boroughs distributed according to Latitude and Rate of Overcrowding, per cent. of that in all County Boroughs.

Per cent. at density exceeding 2 per room.	Degrees of North Latitude.				
	50°–	51°–	52°–	53°–	54°–
0–	17	46	67	39	—
3–	86	68	73	64	—
6–	—	64	66	119	57
9–	80	131	12	122	72
18 and up	—	—	—	—	237
All densities	77	76	65	109	181

23–32. **Tuberculosis.**—The deaths assigned to tuberculous affections in the aggregate numbered 33,259—18,734 of males and 14,525 of females—399 less than those so classified in the previous year.

The standardized death-rate resulting from these figures, 799 per million persons (males 901, females 707), is the lowest yet recorded (Table 9), being 16 per million below the previous lowest rate in 1932, the male rate being 12 per million lower and the female rate 20 per million lower than in that year.

The improvement on the preceding year was limited, as Table XLVII shows, to ages under 25 and over 65 for males, and under 10,

Table XLVII.—Mortality from Tuberculosis (All Forms) per Million Population, 1912–14, 1931, 1932 and 1933.

	Males.				Females.				Persons.			
	1912–14	1931	1932	1933	1912–14	1931	1932	1933	1912–14	1931	1932	1933
All Ages Crude	1,571	1,041	972	968	1,169	762	713	692	1,364	896	837	824
All Ages Standardized	1,542	976	913	901	1,174	772	727	707	1,349	869	815	799
0–	2,081	824	833	701	1,717	678	666	584	1,900	752	750	643
5–	572	276	239	236	580	250	247	211	576	263	243	224
10–	447	216	216	188	687	327	278	288	568	271	247	237
15–	939	790	727	675	1,226	1,145	1,075	1,020	1,084	968	901	847
20–	1,501	1,230	1,203	1,189	1,381	1,353	1,343	1,313	1,439	1,293	1,275	1,252
25–	1,816	1,206	1,116	1,150	1,403	1,129	1,034	1,065	1,599	1,166	1,074	1,107
35–	2,189	1,439	1,273	1,308	1,374	824	752	764	1,767	1,106	991	1,014
45–	2,384	1,636	1,496	1,529	1,185	620	574	539	1,762	1,093	1,002	997
55–	2,213	1,367	1,310	1,320	967	527	503	457	1,553	924	884	863
65–	1,378	857	825	794	752	440	402	397	1,031	626	591	575
75 and up ..	586	360	354	331	440	288	281	221	498	316	309	263

Table XLVIII.—Mortality from Tuberculosis in 1933, per cent. of that in 1912–14 and 1922–24.

	Per cent. of 1912–14.			Per cent. of 1922–24.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
All Ages Crude	62	59	60	79	73	76
All Ages Standardized.	58	60	59	76	74	75
0–	34	34	34	59	60	60
5–	41	36	39	63	54	59
10–	42	42	42	56	54	55
15–	72	83	78	79	80	79
20–	79	95	87	76	86	81
25–	63	76	69	75	83	79
35–	60	56	57	75	74	75
45–	64	45	57	88	67	80
55–	60	47	56	88	67	80
65–	58	53	56	77	68	73
75 and up ..	56	50	53	82	63	71

15–25 and over 45 for females; it was most pronounced at ages under 5, at which ages the fall in mortality had been arrested since 1930.

Comparison with the latter year, a very favourable one when influenza was not epidemic, reveals a decline at every sex and age group except amongst males aged 20–25.

In Table XLVIII the mortality of the year under review is compared at each age with the rates of 20 years earlier, in 1912–14, and of 10 years earlier, in 1922–24. The rates of fall in mortality, expressed in each instance as percentages of the rate at the beginning of the period, (*a*) from 1912–14 to 1922–24 and (*b*) from 1922–24 to 1933, are compared below.

Ages.	Males.		Females.	
	(*a*)	(*b*)	(*a*)	(*b*)
0— ..	—43	—41	—43	—40
5— ..	—35	—37	—32	—46
10— ..	—25	—44	—23	—46
15— ..	— 9	—21	+ 5	—20
20— ..	+ 4	—24	+10	—14
25— ..	—15	—25	— 9	—17
35— ..	—21	—25	—25	—26
45— ..	—27	—12	—32	—33
55— ..	—32	—12	—29	—33
65— ..	—25	—23	—22	—32
75 and up	—31	—18	—20	—37

For children under 10 the relative fall was about the same in each decade, whilst at 10–35 the relative decline has been much greater during the last decade than in the preceding one. Males aged 20–25 and females aged 15–25 registered an increase in the first period followed by a greater fall since 1922–24, and at 25–35 for both sexes and at advanced ages for females the rate of decline as thus measured has been enhanced in the second decade. For males at ages over 45, however, the rate of improvement registered in the first decade has not been maintained.

It was pointed out in the Review for 1932 that the tuberculosis death rate of young adult females had not declined since 1914 to any satisfactory extent, the rate at ages 20–25 for 1930–32 being about 2 per cent. below the level of 1912–14. The 1933 rate shows a slight fall to 5 per cent. below that level or 14 per cent. below the 1922–4 level.

Mortality from respiratory tuberculosis of females aged 25–35 was found (Table XLII of 1932 Review) to have declined since 1911 in the large towns and administrative counties having low densities of population measured by the average number of persons per room in 1931, but not in those having densities exceeding ·85 persons per room. Males aged 15–25 also registered an increase in mortality in the group of districts with highest rates of crowding.

Grouping together areas with over 1 per room average density, phthisis mortality of females aged 15–25 increased from 1911 to 1930–32 by 25 per cent. in the county boroughs and 21 per cent. in the counties, whilst in London with a mean density about 1 per room it increased by 16 per cent. At densities of ·85–1 per room the towns showed no change and the counties an increase of 15 per cent. but at densities below ·85 per room both showed improvement of the order of 20 per cent. On the other hand, at ages 25–45 the fall in mortality was not confined to the better housed areas, but occurred almost irrespective of density.

The 27,854 deaths from respiratory tubercle form 84 per cent. of the total allocated to tuberculosis, and 5·6 per cent. of those from all causes.

The distribution of this mortality by regions and by class of area as well as by sex and age is shown in Table XLIX.

Table XLIX.—Tuberculosis of Respiratory System : Mortality per 100,000 Living at different Ages in different Areas, 1933.

	England and Wales.	Greater London.	London Administrative County.	South-East excluding Greater London.	North.	Midland.	East.	South-West.	Wales.	County Boroughs outside Greater London.	Other Urban Districts outside Greater London.	Rural Districts outside Greater London.
MALES.												
All Ages—												
Crude ..	82	93	110	70	87	79	59	67	82	104	71	53
Standardized..	73	80	93	62	78	71	55	60	77	92	63	49
0— ..	9	8	10	4	13	9	3	4	8	13	6	6
5— ..	6	5	7	2	9	3	6	3	7	8	5	4
15— ..	79	75	78	57	88	79	63	66	111	99	72	61
25— ..	105	114	127	98	110	97	87	86	118	126	95	77
35— ..	123	126	149	120	131	120	95	122	105	156	108	86
45— ..	145	170	207	119	151	153	98	116	129	190	122	81
55— ..	123	158	207	107	130	115	73	77	113	160	100	66
65— ..	71	110	136	56	64	73	46	52	65	90	49	45
75 & up ..	27	44	52	31	23	21	25	27	10	26	22	23
FEMALES.												
All Ages—												
Crude ..	57	55	58	45	60	60	54	48	79	69	53	46
Standardized	56	51	54	44	59	58	54	48	82	67	53	46
0— ..	7	6	9	5	10	6	4	4	6	10	6	5
5— ..	11	6	7	6	16	9	13	6	16	15	11	8
15— ..	105	93	99	69	115	111	92	84	173	129	99	82
25— ..	97	92	97	85	94	100	100	95	150	109	95	84
35— ..	71	67	65	63	73	76	69	56	88	84	65	60
45— ..	49	48	49	41	47	57	49	43	62	59	42	41
55— ..	40	38	43	34	42	42	43	43	43	48	35	36
65— ..	33	36	38	33	33	32	37	21	31	36	29	31
75 & up ..	15	20	20	16	14	9	12	19	11	15	13	13

The relation of phthisis mortality to urbanisation is manifested by the decline of the standardized rate for males from 92 per 100,000 in the county boroughs outside Greater London and 93 in London itself, to 49 in the rural districts. For females the effect of urbanisation is not so great, the rates being 67 in the county boroughs, 54 in London, and 46 in the rural districts.

The regional distribution indicates that for males the standardized rate is highest in Greater London, the North and Wales, whilst for females it is much higher in Wales than elsewhere, and below the general average in Greater London. For males this rate is lowest in the East and South West and for females in the South East outside Greater London. The Welsh rates are below the general average for children under 5, and for males over 35 and females over 65, but show a large excess at ages 15–25, amounting to 41 per cent. for males and 65 per cent. for females, and at ages 25–35, amounting to 12 for males and 55 for females. The favourable position of the South East excluding Greater London is also most manifest at ages 15–25, the male rate being 28 per cent. and the female rate 34 per cent. below the general average. The ratios of male to female mortality at ages over 25 present considerable contrasts in the various regions, as shown below.

	Male mortality per cent. of female.					
	15–	25–	35–	45–	55–	65–75
Greater London	81	124	188	354	416	306
South East (excluding Greater London)	83	115	190	290	315	170
North	77	117	179	321	310	194
Midland ..	71	97	158	268	274	228
East	68	87	138	200	170	124
South West ..	79	91	218	270	179	248
Wales	64	79	119	208	263	210

In each of the years 1931, 1932 and 1933, Greater London has given the highest ratio at 25–35 and 55–65, followed by the North or South East, whilst at 15–25 and 35–45 either Greater London or the South East have been highest, and at 45–55 and 65–75 either Greater London or the North. The lowest ratio has been evident in the East and Wales at 25–35 and 45–55, in Wales at 35–45 and in the East at 55–65.

Amongst counties of over 100,000 population the lowest rates were those of Derbyshire, 415, Wiltshire, 422, Buckinghamshire, 436; Norfolk, 438; Cheshire, 439 and Dorset, 442.

The highest county borough rates were those for South Shields, 1,376, Bootle, 1,308; Middlesbrough, 1,276; and Liverpool, 1,182. The Dewsbury rate, 466, was lowest.

The standardized death rate from tuberculosis of the intestines and peritoneum declined further (Table 8) for males to a new low record of 27 per million, whilst for females the rate of 28 was slightly higher than the lowest rate of 1932 (27). The standardized rates for tuberculosis of the nervous system, which had shown no tendency to decline from 1928 to 1931, declined to low records of 75 for males and 71 for females.

The rapidity with which non-respiratory tuberculosis mortality in general continues to fall may be gathered from the fact that during the eleven years covered by Table 8 the standardized rate for each sex has fallen without interruption, from 264 to 172 for males, or by 35 per cent., and from 235 to 148 for females, or by 37 per cent., the percentage decline for the respiratory form of the disease in the same period being 19 for males and 21 for females. The proportion of non-respiratory to total (standardized) mortality was 24 per cent. in 1923 and 20 in 1933.

When the county boroughs are grouped according to their latitude and the percentage of their populations living at densities exceeding 2 per room (Table L), the mortality rates from non-respiratory tuberculosis during 1929–33 at ages under 5, and at the school ages 5–15, are seen to be higher in the Northern zones than elsewhere, but to present no consistent correlation with the overcrowding index.

44 (1 and 2). **Vaccinia and deaths following Vaccination.**— Three deaths have been assigned to the heading of vaccinia in 1933, consisting of two male infants aged 3 and 4 months with vaccinia and a female aged 17 years with post-vaccinal encephalitis.

Table L.—Mortality from Tuberculosis, other than respiratory, under 15 years of age, 1929-33, in the County Boroughs distributed according to Latitude and Rate of Overcrowding, per cent. of that in all County Boroughs.

Age.	Per cent. at density exceeding 2 per room.	Degrees of North Latitude.				
		50°–	51°–	52°–	53°–	54°–
Under 5 years	0–	64	86	103	107	—
	3–	99	76	78	102	—
	6–	—	75	85	103	79
	9–	82	98	72	107	148
	18 and up	—	—	—	—	149
	All densities	91	80	84	105	145
5–15	0–	65	59	117	57	—
	3–	91	85	81	91	—
	6–	—	100	64	99	156
	9–	80	72	52	105	149
	18 and up	—	—	—	—	204
	All densities	86	84	76	99	186

Two deaths have been classed to the group "other sequelæ of vaccination" (44 : 2), a male aged 4 months with broncho-pneumonia* and a female aged 6 months with septicæmia, both following vaccination. The death of a male infant aged 2 months from meningitis occurring 3 weeks after vaccination had been performed but without evidence of causal association, was assigned to meningitis as cause. In each of the above deaths vaccination was mentioned on the certificate. The death, stated to be due to pulmonary œdema and acute encephalitis, of a female aged 54 who was found on inquiry to have also suffered from a post-vaccinal encephalitis many years before, was classed to No. 78(*b*).

45–53. **Cancer.**—The deaths ascribed to cancer during 1933 numbered 61,572—28,837 of males and 32,735 of females. For both sexes these numbers are the highest yet recorded.

Of these deaths 53,458 were referred to carcinoma, 2,741 to sarcoma, and 5,373 to "cancer" not otherwise defined. These are the largest numbers yet recorded for total cancer and for carcinoma, but not for sarcoma, which of late years has accounted for a somewhat smaller proportion, now 45 per 1,000, of the total cancer deaths than heretofore.

The standardized death-rate for males in 1933 amounts to 1,035 per million, and that for females to 973. In 1928 the increase in female mortality was arrested and the rate decreased each year to 966 in 1932, but again shows a slight rise in 1933. Table XLI,† in the 1927 volume, shows that the standardized rate for males first exceeded that for females in 1924, and since that date the excess has been maintained, increasing to 86 per million in 1932. In 1933 the male rate was below the high record of the preceding year, the rate for each sex being almost identical with that of 1931. The crude death-rate is seen from Table 7 to be still in excess for females to the extent of 69 per million living in 1933, compared with 123 ten years earlier, this being due to the greater age of the female population.

For sarcoma the crude rate is 68 per million as against 71, 71, 68, 66 and 69 in the five previous years. When standardized there is a considerable male excess, the rate being 63·0 for males and 45·2 for females in 1933.

The mortality from cancer as a whole is compared by sex and age in Table LI for England and Wales, with record of the degree of difference in sex mortality at the various ages.

At ages from 15 years up to 55 the female exceeds the male rate but from 55 years to the end of life the male rates are in excess, the maximum divergence occurring at 65–75 years. This female excess in middle age, greatest at 35–45, is associated with, and largely explained by, the special frequency at this age of cancer

* In Tables 6, 21, 22, 23 of Part I this death (occurring in March) was included with the vaccinia deaths (44 : 1) but should be transferred to No. 44 : 2.

† This table gives standardized death-rates from Cancer by Sex for each year 1851–1927.

of the uterus and of the female breast, which together account for a larger proportion of the total deaths of women from cancer at each age between 25 and 65 than at all ages jointly (*see* "Text" Volume of the Review for 1929, page 57).

Table LI.—Mortality from Cancer (All Sites), 1933.

	Mortality per Million.			Sex Ratio.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
All Ages { Crude ..	1,490	1,559	1,526	976	1,022	1,000
All Ages { Standardized	1,035	973	997	1,038	976	1,000
0—	36	33	35	1,029	943	1,000
5—	23	19	21	1,095	905	1,000
15—	41	44	43	953	1,023	1,000
25—	115	151	134	858	1,127	1,000
35—	452	731	603	750	1,212	1,000
45—	1,646	2,063	1,870	880	1,103	1,000
55—	4,604	4,141	4,359	1,056	950	1,000
65—	9,863	7,623	8,626	1,143	884	1,000
75—	14,427	11,668	12,738	1,133	916	1,000

The percentage share of the breast and uterus in the total cancer mortality of females, in 1933, was :—

All ages	0–	25–	35–	45–	55–	65–	75–	85–
33·2	4·7	34·4	50·1	48·1	36·5	24·6	23·3	24·3

The mortality attributed to sarcoma, carcinoma and cancer undefined is distinguished in Table LII, other details of the deaths being shown in Tables LIV and LV. The rates for cancer undefined are lower than the average of the five preceding years at every age over 25 except for males aged 35–45, indicating increased precision in the statement of the type of cancer. Sarcoma rates are lower than in 1928–32 at ages 15–75 for males, and at 45 and over for females. Carcinoma rates show an increase at all ages over 25 for males, but for females there is a decline at 25–45.

Table LII also shows the trend of cancer mortality by sex and age since 1901–10.

The crude death-rate at all ages for males in 1933 is 93 per cent. and the female rate 52 per cent. higher than the respective rates in 1901–10, but if standardized rates are compared these excesses are reduced to 32 and 3 per cent. respectively. These great differences in the rate of increase as shown by comparing crude and standardized rates emphasise the desirability of restricting comparison to the latter. The standardized figures take into account the rapidly increasing proportion of elderly persons in the population and attempt to correct, though imperfectly owing to the wide divergence of the age constitution of the present population from that of the 1901 standard, the exaggerated impression conveyed when crude rates are compared.

Table LII.—Cancer Mortality in 1911–20, 1921–30, 1932 and 1933 per cent. of that in 1901–10. Sarcoma, Carcinoma and Undefined ; rates per million in 1928–32 and 1933.

—	Mortality per cent. of the rate in 1901–10.*				Mortality per million living.					
					Sarcoma.		Carcinoma.		Cancer undefined.	
	1911–20	1921–30	1932	1933	1928–32	1933	1928–32	1933	1928–32	1933
MALES.										
All ages—										
Crude	128	167	193	193	81	78	1,189	1,279	154	133
Standardized ..	114	128	134	132	66	63	858	880	111	92
0–	96	100	121	113	22	25	2	1	1	1
15–	107	112	120	100	33	27	12	12	2	3
25–	101	106	106	106	37	35	71	75	9	5
35–	102	101	102	109	69	63	324	350	36	40
45–	108	105	101	106	129	124	1,324	1,374	156	148
55–	114	121	123	118	215	201	3,961	4,015	497	387
65–	120	143	155	148	295	271	8,668	8,698	1,166	893
75 and up ..	124	162	179	183	314	319	11,950	12,661	1,652	1,447
FEMALES.										
All ages—										
Crude	114	135	148	152	58	58	1,280	1,368	159	133
Standardized ..	102	105	103	103	45	45	836	845	103	82
0–	100	111	121	121	19	20	2	2	1	1
15–	103	106	112	133	20	25	14	17	2	2
25–	92	94	94	89	25	26	121	115	12	11
35–	93	90	86	86	42	45	639	629	68	57
45–	98	92	90	89	88	84	1,812	1,812	203	167
55–	99	96	93	94	144	140	3,529	3,674	439	327
65–	107	116	112	114	189	177	6,683	6,731	876	715
75 and up ..	116	143	148	148	236	176	10,405	10,434	1,394	1,057

* The rates per 100,000 at 1901–10, 1911–20, 1921–30 and 1931 were given in Table XLII of the Review for 1931. The percentage ratios in this table are based upon rates per million, that is to say, upon an additional significant figure, and therefore differ slightly from those given in previous years.

The recent trend of the sex death-rates at the several age-groups over 25 is indicated below, the rates per million being expressed as percentages of the 1901–10 rate in each instance.

		1926	1927	1928	1929	1930	1931	1932	1933
Males	25—	108	108	113	111	102	107	106	106
	35—	96	102	103	104	107	102	102	109
	45—	106	104	105	102	106	106	101	106
	55—	122	120	121	119	116	119	123	118
	65—	145	149	149	149	152	153	155	148
75 and up		164	167	172	181	178	173	179	183
Females	25—	96	95	98	93	90	89	94	89
	35—	88	90	93	87	88	87	86	86
	45—	91	90	93	89	88	92	90	89
	55—	97	94	94	93	94	93	93	94
	65—	120	116	118	122	117	114	112	114
75 and up		142	148	152	156	157	149	148	148

Comparison of the last 3 years with the preceding years indicates a declining tendency in the rates for males aged 25–35 and females aged 25–45 and 65–75. Apart from annual fluctuations the rates

for males aged 35–65 and females aged 45–65, have remained almost stationary, whilst for males aged 65–75 the upward trend was interrupted in 1933 by a fall.

Cancer mortality is analysed according to sex, age, region and class of area in Table LIII. The standardized rate for each sex declines, as noticed in previous years, from a maximum in the county boroughs to a minimum in the rural districts, the range

Table LIII.—Cancer (All Sites) : Mortality per 100,000 Living in different Areas and at different Ages, 1933.

	England and Wales.	Greater London.	London Admin. County.	South East, excluding Greater London.	North.	Midland.	East.	South-West.	Wales.	County Boroughs outside Greater London.	Other Urban Districts outside Greater London.	Rural Districts outside Greater London.
MALES.												
All Ages—												
Crude	149	153	172	161	145	142	158	155	137	153	147	143
Standardized..	104	113	122	98	107	102	91	88	98	112	100	87
0– ..	4	3	4	4	3	4	6	3	7	4	4	3
5– ..	2	2	2	2	2	3	1	1	3	3	2	2
15– ..	4	5	6	5	4	4	2	4	3	4	4	3
25– ..	11	13	15	12	12	11	9	9	8	12	11	10
35– ..	45	48	44	42	49	48	30	29	42	55	40	35
45– ..	165	176	205	155	176	155	130	127	168	183	158	132
55– ..	460	510	573	410	490	459	364	376	413	517	432	366
65– ..	986	1,051	1,121	952	1,025	961	909	868	961	1,076	972	844
75 and up ..	1,443	1,622	1,646	1,410	1,364	1,411	1,583	1,389	1,333	1,355	1,482	1,363
FEMALES.												
All Ages—												
Crude	156	150	159	176	151	145	187	180	146	153	159	164
Standardized..	97	95	99	94	101	94	103	90	101	100	98	94
0– ..	3	4	5	5	5	1	6	—	—	3	3	3
5– ..	2	2	2	1	1	3	3	1	3	2	2	2
15– ..	4	4	6	6	4	4	4	5	5	5	4	5
25– ..	15	17	16	13	14	17	14	13	17	15	15	14
35– ..	73	73	81	69	75	70	73	66	86	73	78	66
45– ..	206	207	219	207	209	193	235	186	220	216	202	195
55– ..	414	394	414	392	436	414	409	414	425	433	411	410
65– ..	762	728	756	717	836	734	793	665	805	793	772	738
75 and up ..	1,167	1,175	1,128	1,189	1,173	1,131	1,292	1,129	1,040	1,147	1,180	1,166

according to urbanisation, as thus measured, being greater for males, 112 to 87, than for females, 100 to 94. The London rate for males (122) is in excess of that for the county boroughs, but for females it is slightly lower.

These relations suggest that cancer may be more often certified in the towns because hospital and other facilities for its recognition are there greatest, but successful treatment, particularly of cancer of the breast and uterus, in so far as it reduces mortality, tends to affect the rates in the opposite sense.

Apart from Greater London, the North gives the highest standardized mortality for males and the East for females, whilst the South-West shows the lowest rate for each sex. The regional dispersion thus indicated is greater for males, 88–107, than for females, 90–103.

Cancer by Site.—The parts of the body affected by fatal cancer in 1933 are shown in Tables LIV and LV in greater detail than that provided by the international classification, six out of its nine headings (Nos. 45–53) being sub-divided. Fuller details with regard to cancer of the uterus and of the skin than those shown in

Table. LIV.—Sites and Forms of Fatal Cancer by Sex and Age, 1933.

	All Ages.	0–	5–	15–	25–	35–	40–	45–	50–	55–	60–	65–	70–	75–	80–	85–
	DEATHS OF MALES.															
All Sites	**28,837**	**54**	**78**	**135**	**372**	**420**	**734**	**1,404**	**2,384**	**3,666**	**4,781**	**5,359**	**4,565**	**3,150**	**1,315**	**420**
Carcinoma	**24,749**	**1**	**4**	**38**	**244**	**315**	**577**	**1,171**	**1,992**	**3,167**	**4,201**	**4,705**	**4,047**	**2,758**	**1,150**	**379**
Sarcoma	**1,514**	**50**	**71**	**87**	**112**	**66**	**94**	**123**	**162**	**190**	**178**	**159**	**114**	**73**	**26**	**9**
Cancer N.S.	**2,574**	**3**	**3**	**10**	**16**	**39**	**63**	**110**	**230**	**309**	**402**	**495**	**404**	**319**	**139**	**32**
45 Lip	241	—	—	—	2	—	2	8	12	14	27	44	50	45	26	11
45 Tongue	1,031	—	—	—	—	4	6	27	73	150	205	228	179	112	34	13
45 Mouth	291	—	—	—	2	1	2	3	20	43	63	71	37	27	16	6
45 Tonsil	283	—	3	—	3	1	4	7	17	42	56	51	51	28	15	5
45 Jaw	420	1	3	1	6	8	12	13	38	59	52	89	65	44	18	11
45 Pharynx	365	1	—	2	5	4	5	11	29	58	78	78	54	25	13	2
45 Others (1)	181	—	—	—	—	—	—	6	15	26	39	30	24	29	11	1
Total	2,812	2	6	3	18	18	31	75	204	392	520	591	460	310	133	49
46 Œsophagus	1,667	—	—	1	3	7	13	44	113	259	362	370	236	171	65	23
46 Stomach	6,439	—	1	4	73	91	188	383	641	874	1,094	1,208	966	636	219	61
46 Small intestine	103	—	2	—	3	3	4	7	11	20	13	13	10	9	7	1
46 Cæcum	246	—	1	1	3	2	7	12	17	32	44	55	32	25	11	4
46 Hepatic flexure	44	—	—	—	—	—	1	2	—	9	6	11	7	4	2	2
46 Splenic flexure	79	—	1	—	3	1	2	2	5	4	14	22	16	6	2	1
46 Sigmoid flexure	703	—	—	1	6	11	10	25	40	85	116	146	128	87	41	7
46 Large intestine (colon)	2,317	—	—	2	19	26	49	81	164	251	335	470	447	296	130	47
46 Rectum (excluding anus)	3,103	—	1	8	30	33	68	104	210	346	545	597	569	402	153	37
46 Liver	1,278	—	2	2	12	18	29	44	78	137	214	238	249	163	75	17
46 Gall bladder	269	—	—	—	—	3	3	14	17	31	37	53	48	38	15	10
46 Pancreas	907	—	—	3	7	5	31	56	105	130	149	156	127	88	41	9
46 Others (2)	549	6	2	3	12	8	10	18	43	46	77	92	98	88	38	8
Total	17,704	6	10	25	171	208	415	792	1,444	2,224	3,006	3,431	2,933	2,013	799	227
47 Larynx	889	—	—	—	2	6	17	37	85	138	195	194	107	63	35	10
47 Lung	1,820	1	1	15	49	79	112	254	290	334	282	193	131	59	18	2
47 Others (3)	262	—	1	2	10	11	22	23	34	41	35	38	27	15	3	—
Total	2,971	1	2	17	61	96	151	314	409	513	512	425	265	137	56	12
50 Breast	55	—	—	—	—	1	2	1	8	7	8	11	7	6	3	1
51 Kidney, suprarenal	357	25	11	1	6	11	23	31	37	58	61	36	28	18	10	1
51 Bladder, urethra, ureter	922	—	—	—	—	7	17	44	61	122	121	168	184	130	51	17
51 Prostate	1,629	—	2	—	2	3	3	13	37	98	230	372	386	305	143	35
51 Testis	149	—	1	13	30	19	17	10	14	8	11	8	8	6	2	2
51 Penis	156	—	—	—	—	3	5	6	12	13	19	26	25	22	17	8
51 Scrotum	64	—	—	—	—	2	2	4	5	6	13	9	8	11	2	2
Total	3,277	25	14	14	38	45	67	108	166	305	455	619	639	492	225	65
52 Skin	618	—	—	5	5	6	6	19	19	46	76	94	116	98	71	57
53 Brain, Meninges	155	4	17	7	19	16	15	15	26	18	7	8	3	—	—	—
53 Thyroid	46	—	—	2	3	—	2	4	2	9	7	8	6	2	1	—
53 Bones (jaw excepted)	400	7	13	37	24	12	14	29	39	51	57	49	33	26	7	2
53 Others (4) and unspecified	799	9	16	25	33	18	31	47	67	101	133	123	103	66	20	7
Total	1,400	20	46	71	79	46	62	95	134	179	204	188	145	94	28	9

(1) Includes Palate, Cheek (internal surface), Salivary Glands, Gums.
(2) ,, Intestine undefined, Peritoneum, Omentum, Mesentery, Anus.
(3) ,, Mediastinum.
(4) ,, Lymphatic Glands, Abdomen, Eye, Muscle, etc.

Table LIV.—*cont.*

		All Ages.	0–	5–	15–	25–	35–	40–	45–	50–	55–	60–	65–	70–	75–	80–	85–
		DEATHS OF FEMALES.															
	All Sites	32,735	48	61	147	517	794	1,408	2,340	3,176	3,959	4,590	4,796	4,665	3,479	1,869	886
	Carcinoma	28,709	5	4	57	392	688	1205	2,034	2,810	3,487	4,098	4,233	4,121	3,113	1,666	796
	Sarcoma	1,227	39	55	82	88	50	86	102	123	145	143	117	103	54	23	17
	Cancer, N.S.	2,799	4	2	8	37	56	117	204	243	327	349	446	441	312	180	73
45	Lip	26	—	—	—	—	—	—	—	—	6	3	4	1	4	6	2
	Tongue	125	—	—	—	—	4	5	5	10	13	17	21	22	10	16	2
	Mouth	44	—	—	—	1	1	1	1	4	10	6	3	7	5	3	2
	Tonsil	37	—	—	1	—	2	3	3	3	2	5	3	4	5	4	2
	Jaw	155	—	1	3	5	2	8	6	19	21	18	22	23	16	7	4
	Pharynx	110	—	1	1	1	3	4	12	18	12	18	21	10	5	1	3
	Others (1)	40	—	—	—	1	1	1	3	6	1	5	7	5	7	2	1
	Total	537	—	2	5	8	13	22	30	60	65	72	81	72	52	39	16
46	Œsophagus	629	—	—	—	4	8	23	37	70	104	93	98	85	55	35	17
	Stomach	5,490	—	—	5	51	71	148	247	385	600	782	1,002	999	716	356	128
	Small intestine	89	—	—	—	—	2	3	8	11	12	11	11	14	11	3	3
	Cæcum	356	—	—	1	4	7	6	10	26	36	47	58	70	52	28	11
	Hepatic flexure	52	—	—	—	—	2	1	2	4	2	9	6	12	8	5	1
	Splenic flexure	105	—	—	—	4	—	1	3	6	7	20	14	22	17	9	2
	Sigmoid flexure	719	—	—	5	8	17	13	38	52	76	127	117	125	78	40	23
	Large intestine (colon)	3,029	—	—	3	32	40	66	118	188	243	390	490	571	495	260	133
	Rectum (excluding anus)	1,930	—	—	7	34	39	56	97	130	222	285	323	333	247	108	49
	Liver	1,301	4	—	7	4	13	30	51	65	130	177	236	249	203	87	45
	Gall bladder	586	—	—	—	3	7	7	19	45	69	75	106	116	70	48	21
	Pancreas	856	1	1	2	10	9	25	37	71	105	138	136	143	107	48	23
	Others (2)	816	2	3	4	14	13	40	33	47	66	97	134	132	128	68	35
	Total	15,958	7	4	34	168	228	419	700	1,100	1,672	2,251	2,731	2,871	2,187	1,095	491
47	Larynx	239	—	—	—	3	5	14	25	30	38	33	31	29	16	11	4
	Lung	582	1	3	5	17	18	29	58	62	87	102	97	53	31	17	2
	Others (3)	132	1	2	2	3	3	7	7	11	18	21	24	14	12	6	1
	Total	953	2	5	7	23	26	50	90	103	143	156	152	96	59	34	7
48	Uterus	4,313	—	1	7	99	190	309	513	629	637	609	520	407	244	118	30
49	Ovary	1,399	1	4	20	57	55	110	172	199	221	193	168	105	59	23	12
	Vulva	468	—	—	1	1	8	11	23	34	40	61	73	81	65	49	21
	Others	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
	Total	1,868	1	4	21	58	63	121	196	233	261	254	241	186	124	72	33
50	Breast	6,551	—	—	4	79	213	391	676	837	941	937	716	688	546	338	185
52	Skin	500	1	1	2	6	8	5	17	26	28	46	52	75	83	75	75
53	Brain, meninges	117	2	5	10	12	9	12	12	21	16	10	3	2	3	—	—
	Thyroid	196	—	—	—	7	3	7	10	27	25	23	38	26	18	8	4
	Kidney, suprarenal	301	21	8	2	9	7	23	18	29	32	56	39	28	20	7	2
	Bladder, urethra, ureter	435	—	1	2	3	1	7	21	26	33	49	84	86	63	38	21
	Bones (jaw excepted)	354	3	16	37	23	17	15	27	38	33	35	44	28	19	11	8
	Others (4) and unspecified	652	11	14	16	22	16	27	30	47	73	92	95	100	61	34	14
	Total	2,055	37	44	67	76	53	91	118	188	212	265	303	270	184	98	49

(1) Includes Palate, Cheek (internal surface), Salivary Glands, Gums.
(2) ,, Intestine undefined, Peritoneum, Omentum, Mesentery, Anus.
(3) ,, Mediastinum.
(4) ,, Lymphatic Glands, Abdomen, Eye, Muscle, etc.

the Table are also available. The cancer mortality distribution is shown by sex, age and site as well as by the nature of the growth to which the deaths were attributed, under the headings carcinoma, sarcoma and "cancer" not otherwise defined. Continuing the

Table LV.—Forms of Fatal Cancer of each Site, 1933.

		Males.						Females.					
		Number of Deaths.			Percentage of all Cancers.			Number of Deaths.			Percentage of all Cancers.		
		Carcinoma.	Sarcoma.	"Cancer," Not otherwise defined.	Carcinoma.	Sarcoma.	"Cancer," Not otherwise defined.	Carcinoma.	Sarcoma.	"Cancer," Not otherwise defined.	Carcinoma.	Sarcoma.	"Cancer," Not otherwise defined.
	All Sites	**24,749**	**1,514**	**2,574**	**86**	**5**	**9**	**28,709**	**1,227**	**2,799**	**87**	**4**	**9**
45	Lip	225	1	15	94	0	6	26	—	—	100	—	—
	Tongue	951	—	80	92	—	8	116	—	9	93	—	7
	Mouth	271	—	20	93	—	7	43	—	1	98	—	2
	Tonsil	232	25	26	82	9	9	23	11	3	62	30	8
	Jaw	291	96	33	69	23	8	103	44	8	67	28	5
	Pharynx	323	11	31	89	3	8	96	6	8	88	5	7
	Others	165	4	12	91	2	7	37	2	1	92	5	3
	Total	2,458	137	217	87	5	8	444	63	30	82	12	6
46	Œsophagus	1,500	3	164	90	0	10	557	—	72	89	—	11
	Stomach	5,948	5	486	92	0	8	5,089	1	400	93	0	7
	Small intestine	74	13	16	71	13	16	83	2	4	94	2	4
	Cæcum	224	3	19	91	1	8	329	1	26	93	0	7
	Hepatic flexure ..	43	—	1	98	—	2	51	—	1	98	—	2
	Splenic flexure	74	—	5	94	—	6	92	—	13	88	—	12
	Sigmoid flexure	666	1	36	95	0	5	665	2	52	93	0	7
	Large intestine (colon)	2,161	3	153	93	0	7	2,852	1	176	94	0	6
	Rectum (excluding anus)	2,883	1	219	93	0	7	1,804	4	122	94	0	6
	Liver	1,061	14	203	83	1	16	1,093	14	194	84	1	15
	Gall bladder	239	—	30	89	—	11	524	1	61	90	0	10
	Pancreas	830	2	75	92	0	8	780	4	72	92	0	8
	Others	402	63	84	74	11	15	615	65	136	75	8	17
	Total	16,105	108	1,491	91	1	8	14,534	95	1,329	91	1	8
47	Larynx	805	1	83	91	0	9	217	3	19	91	1	8
	Lung	1,526	117	177	84	6	10	439	64	79	75	11	14
	Others	144	56	62	55	21	24	67	37	28	51	28	21
	Total	2,475	174	322	83	6	11	723	104	126	76	11	13
48.	Uterus	—	—	—	—	—	—	3,867	71	375	89	2	9
49	Ovary	—	—	—	—	—	—	1,184	39	176	84	3	13
	Vulva	—	—	—	—	—	—	441	5	22	94	1	5
	Others	—	—	—	—	—	—	1	—	—	100	—	—
	Total	—	—	—	—	—	—	1,626	44	198	87	2	11
50.	Breast	49	4	2	89	7	4	6,008	43	500	91	1	8
51	Kidney, suprarenal ..	152	173	32	43	48	9	—	—	—	—	—	—
	Bladder, urethra, ureter	827	3	92	90	0	10	—	—	—	—	—	—
	Prostate	1,394	9	226	85	1	14	—	—	—	—	—	—
	Testis	82	52	15	55	35	10	—	—	—	—	—	—
	Penis	142	1	13	91	1	8	—	—	—	—	—	—
	Scrotum	61	—	3	95	—	5	—	—	—	—	—	—
	Total	2,658	238	381	81	7	12	—	—	—	—	—	—
52.	Skin	548	51	19	89	8	3	429	54	17	86	11	3
53	Brain, meninges ..	16	124	15	10	80	10	9	90	18	8	77	15
	Thyroid	40	5	1	87	11	2	187	3	6	95	2	3
	Kidney, suprarenal ..	—	—	—	—	—	—	127	146	28	42	49	9
	Bladder, urethra, ureter	—	—	—	—	—	—	389	4	42	89	1	10
	Bones (jaw excepted) ..	60	320	20	15	80	5	54	279	21	15	79	6
	Others and unspecified	340	353	106	43	44	13	312	231	109	48	35	17
	Total	456	802	142	33	57	10	1,078	753	224	52	37	11

practice of many years past, every practicable effort is made, with the co-operation of certifying practitioners, to assign the deaths to the organs primarily affected, in order to obtain as true indications as possible of the incidence of the disease. It is well recognized, however, that for certain organs, especially the liver and lung, commonly affected secondarily to such a degree that the symptoms dominate any that may arise from the primarily affected organ, ascertainment of the latter may prove impracticable. Such exceptions are becoming more rare, due no doubt to improvement in diagnostic methods, an encouraging sign justifying the inclusion, in the notes to certifying medical practitioners which accompanies the book of death certificates, of the request that "the seat of primary occurrence should be returned in all cases where known."

The distribution of cancers of each individual site, according to the nature of the growth is given in Table LV. The percentage of cancers with nature undefined is, amongst the organs distinguished, highest for the liver, prostate, ovary and brain. The percentage of all cancers defined as sarcoma ranges from 79 for the bones and brain, 48 for kidney or suprarenal and 35 for the testis to 1 per cent. for the digestive tract and female breast.

The facts as to cancer mortality distribution by sex, age and site contained in Table LIV are summarized for each site in Table LVI, which compares total mortality in 1933 with the rates for other recent periods for the same sex and site. In this table the tendency to increase of mortality merely in consequence of increase in the proportion of persons at risk falling within those ages at which cancer chiefly occurs, as well as the tendency to female excess for the same reason, has been allowed for by standardization, so that all the rates quoted may be compared with one another.

The chief increases in 1933, over the previous year are, for males—lung 9·8 per million, intestine 2·6, bladder 0·5, pancreas, kidney and suprarenal 0·4, and for females—intestine 6·6, stomach 2·9, pancreas and ovary 1·6, breast 1·3, bladder 0·8, lung 0·4.

The sites showing at least 25 per cent. increase in mortality from 1911–20 to 1933 are, for males, the lung (426 per cent.), prostate (117), pancreas (94), gall bladder (60), kidney and suprarenals (55), intestine (44), testis (35), larynx (29), and breast (25), and for females the lung (151), pancreas (89), ovary and Fallopian tube (85), kidney and suprarenals (43), gall bladder (42), and intestine (29). Those showing a decline are the tongue, mouth, jaw, liver, mesentery and skin in both sexes, uterus, rectum, mediastinum and rodent ulcer in females and lip, œsophagus, penis and scrotum in males.

The rate for cancer of the *lung* in males was more than six times as great in 1933 as in 1901–10, and in females more than twice as great. Whilst the magnitude of the increase in both sexes suggests that improved means of diagnosis is partly responsible, the much greater increase for males than females requires some other explanation.

Table LVI.—Cancer Mortality : Rates per Million Population (Standardized) for the more important Sites for each Sex 1901–10, 1911–20, 1921–30, 1929, 1930, 1931, 1932 and 1933.

	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
	All Sites.		Lip.		Tongue.		Mouth and Tonsil.		Jaw.	
1901–10	784	942	12·8	0·8	43·1	4·4	?	?	22·6	6·9
1911–20	897	959	12·6	0·7	50·8	4·3	23·5	3·0	25·1	7·2
1921–30	1,004	986	11·5	0·7	46·1	3·8	28·3	3·6	20·8	6·4
1929	1,031	999	10·4	0·6	41·8	4·1	27·6	3·5	19·2	6·5
1930	1,031	987	11·3	0·7	40·6	3·5	29·3	3·8	16·7	5·3
1931	1,034	974	10·7	0·5	38·1	3·6	29·4	3·5	16·5	5·1
1932	1,052	966	10·3	0·6	37·6	3·4	21·2	2·4	16·6	5·2
1933	1,035	973	8·7	0·7	35·7	3·6	20·1	2·4	15·2	4·8
	Pharynx.		Œsophagus.		Stomach.		Liver.		Gall-bladder.	
1901–10	?	?	51·2	14·6	167·2	133·0	?	?	?	?
1911–20	10·8	3·0	60·6	16·5	186·4	139·0	87·1	98·0	6·0	11·6
1921–30	12·6	3·0	64·2	18·1	221·1	155·5	61·0	60·9	8·8	16·6
1929	13·8	2·8	62·3	18·3	237·2	164·6	52·3	50·6	9·4	17·6
1930	11·8	3·2	61·8	18·6	233·7	162·8	47·7	45·4	9·5	17·1
1931	13·0	3·1	62·8	18·7	231·3	155·5	47·0	42·7	9·2	16·9
1932	14·7	3·4	62·5	19·5	233·3	153·8	45·7	38·9	10·8	16·9
1933	12·8	3·4	57·8	18·3	229·2	156·7	45·5	36·8	9·6	16·5
	Mesentery and Peritoneum.		Intestine.		Rectum and Anus.		Ovary and Fallopian Tube.		Uterus.	
1901–10	8·2	15·8	63·5	72·3	79·8	55·9	—	19·2	—	?
1911–20	6·0	12·0	96·8	109·2	93·6	59·3	—	24·3	—	174·4
1921–30	5·4	8·1	125·4	129·9	105·5	59·8	—	36·0	—	157·9
1929	4·4	7·2	134·3	138·6	108·0	58·3	—	40·8	—	150·3
1930	4·9	6·6	136·9	138·4	110·6	59·9	—	42·3	—	143·9
1931	5·3	6·6	136·1	136·3	109·1	59·5	—	42·7	—	139·9
1932	4·6	6·3	136·8	133·9	113·5	59·8	—	43·3	—	137·8
1933	3·9	6·0	139·4	140·5	111·1	56·5	—	44·9	—	134·5
	Breast.		Rodent Ulcer.		Penis.		Scrotum.		Other Skin.	
1901–10	1·5	158·4	?	?	?	—	?	—	?	?
1911–20	1·6	170·8	6·7	4·3	6·6	—	2·4	—	17·6	10·9
1921–30	1·8	189·1	8·4	4·9	6·4	—	2·7	—	17·6	10·2
1929	1·8	195·7	9·5	5·0	5·7	—	2·7	—	18·2	10·7
1930	2·3	194·5	9·1	4·6	6·3	—	2·3	—	16·1	9·0
1931	2·3	200·2	9·0	4·7	6·5	—	2·6	—	17·5	9·2
1932	1·8	196·6	8·0	4·2	6·0	—	2·8	—	16·1	11·0
1933	2·0	197·9	7·2	3·9	5·7	—	2·3	—	15·6	9·9
	Larynx.		Lung.		Pancreas.		Kidney and Suprarenals.		Bladder.	
1901–10	?	?	10·2	7·0	14·5	11·8	8·4	7·6	?	?
1911–20	23·9	6·0	12·7	7·0	16·7	13·1	9·1	7·2	28·2	9·7
1921–30	31·3	7·1	25·2	9·6	26·3	19·5	11·7	8·9	30·5	11·4
1929	31·4	7·6	33·4	11·9	30·3	20·0	13·2	9·6	32·3	12·3
1930	31·6	8·5	40·2	13·9	29·4	23·8	13·0	8·7	31·8	11·5
1931	31·7	7·9	51·2	16·3	28·8	21·6	13·9	9·5	34·2	11·0
1932	30·7	7·2	57·0	17·2	32·0	23·1	13·7	10·1	32·0	11·2
1933	30·8	7·1	66·8	17·6	32·4	24·7	14·1	10·3	32·5	12·0
	Prostate.		Testis.		Bones.		Mediastinum.			
1901–10	11·8	—	?	—	?	?	8·1	4·5		
1911–20	26·5	—	4·9	—	15·7	12·0	9·2	4·6		
1921–30	47·7	—	5·8	—	17·6	13·5	12·6	5·8		
1929	56·4	—	5·2	—	17·6	14·6	12·1	5·6		
1930	54·9	—	6·7	—	17·3	12·0	13·1	5·3		
1931	56·4	—	5·9	—	16·5	11·7	11·4	4·6		
1932	58·5	—	6·8	—	16·8	13·3	9·8	4·0		
1933	57·4	—	6·6	—	16·4	13·0	9·8	4·1	—	—

The continued increase in mortality from cancer of the *prostate* has been accompanied by an increasing mortality assigned to non-malignant prostatic diseases which has risen by 51 per cent. since 1923 (Table 8). The rate of increase in the standardized mortality from cancer of this organ since 1911–20 is 63 per cent. at ages under 65, 120 at 65–75 and 168 at 75 and upwards.

Excepting the testis, breast and larynx for males all the sites mentioned above as showing high rates of increase are included in the group of inaccessible sites in the Review for 1926 (p. 66). It is therefore probable that these increases are, in some

measure, due to improvement in diagnosis, and in the case of cancer of the intestines, pancreas and gall bladder, to the continual transfer of certification from secondary cancer of the liver and mesentery and peritoneum to the primary site which has been in progress since 1901–10.

The increase in the mortality from cancer of the *larynx* and of the *rectum* for males may, in view of their greater accessibility, be more real than that from the other sites. The rate of increase for rectal cancer from 1911–20 to 1933, has been 19 per cent. for males but the rate has slightly fallen for females.

Mortality from cancer of the *breast*—the most frequent site in females and accounting for about one-fifth of their total cancer mortality—increased in 1911–20 by 8 per cent. over the previous decennium and in the next decennium the rate of increase was 11 per cent., whilst mortality in 1933 is 5 per cent. in excess of that during 1921–30. There has not, however, been any consistent change since 1928. Many cases of breast cancer followed after removal by secondary cancer of the liver were formerly certified under the latter description and the transfer of such deaths with improved certification doubtless accounts for the greater decline in the liver rate for females than for males and for part of the rise in the breast rate. The increase in standardized mortality from breast cancer since 1901–10 has been 25 per cent. at ages under 65, 18 at 65–75, and 35 at 75 and upwards. In so far as treatment only delays the fatal issue in many cases it must tend to increase the rates at later ages at the expense of those at earlier ages. It was shown in the Review for 1932 (Table LII and p. 72) that whilst mortality at ages 35–55 had increased from 1911–20 to 1930–32 by about 10 per cent. in married and single alike, at ages over 55 the increase had been much greater amongst the married than the single.

The fall between 1911–20 and 1933 of 23 per cent. in the mortality from *uterine* cancer—now the fourth site in order of frequency—is of great significance. No other site of similar importance shows such a decline for either sex. The extent of the fall increases from 25 per cent. at ages under 45 to 26 per cent. at 45–65, and then diminishes again. Analysis of 1930–32 mortality by marital condition (Review for 1932, p. 72) showed that whilst at ages under 45 mortality had declined from 1911–20 to 1930–32 to a greater degree amongst the married than the single, between 45 and 75 the relative improvement was almost the same in each group of women (about 25 per cent. fall at ages 45–65 and 13 per cent. at 65–75).

Mortality rates from cancer of the *lip*, *tongue* and *jaw* have declined almost continuously since 1911–20 for both sexes. The female mortality from lingual cancer is extremely low compared with the mortality among males The male rate fell in 1933 for the sixth year in succession, the rate of 35·7 per million being only 70 per cent. of the mean rate in 1911–20.

The standardized mortality from syphilitic diseases (syphilis, tabes, general paralysis and aneurysm) in males also declined for the fifth year in succession, the rates per million in each year from 1927 being 161, 161, 153, 145, 143, 133, 126.

Cancer of the *ethmoid* has recently received attention owing to a suspected occupational factor in its causation. The precise point of origin of cancerous growths of the nose is not always ascertainable and an analysis has therefore been made of all deaths attributed to nasal cancer in males during 1933 (included in Nos. 45 and 53).

	All ages	0–	45–	55–	65–	75 and up
Ethmoid sinus or cells	13	2	2	5	2	2
Nasal bones or septum	5	1	2	2	—	—
Sphenoidal sinus or sphenoid ...	5	2	1	—	2	—
Nasal fossæ, nares, nostril	11	—	—	4	5	2
" Nose " (chiefly epithelioma) ...	17	—	1	3	6	7

The occupations were as follows, in order of increasing age at death within each group. First group : child, 2 nickel workers (42, 46), farmer, bedstead worker, excise official, army officer, tailors' cutter, shoe finisher, green-grocer, general labourer, awl blade maker, fire brigade officer. Second group : general labourer, gas-producer in nickel works, tram conductor, nickel worker, lithographic printer. Third group : general labourer, unoccupied, bus conductor, butcher, cabinet maker. Fourth group : corporation labourer, leather dresser, coal merchant, carpenter, farm horseman, lace draughtsman, railway engine driver, engineer's labourer, agricultural labourer, butcher, naval pensioner. Fifth group : shoe finisher, medical practitioner, general labourer, clerk, textile engineer, farm labourer, banker, commercial traveller, bobbin (lace) worker, carpenter-joiner, farm bailiff, transport worker, shoe finisher, unoccupied, architect, seaman, agricultural worker. The 4 deaths of men employed in nickel works were registered in Glamorganshire; the remainder were scattered throughout the country.

54. **Tumours not returned as malignant.**—As in other recent years all deaths from tumours not definitely stated to be malignant have been assembled in Table LVII. These numbered 3,086, the tumour being returned as benign in 1,803 instances, and its nature in the remaining 1,283 being unstated. The classification differs from that in use prior to 1931, as explained in the Review for 1931.

" Adenoma " of the prostate is classed to diseases of the prostate, No. 137, rather than to these headings because this condition seems to be scarcely distinguishable from that described as prostatic hypertrophy. Benign tumours other than adenoma or the varieties of it shown in Table LVII are classed to No. 54 (3 only in 1933) and tumours of unstated nature to No. 55. Mortality attributed to prostatic diseases is seen from Table 8 to have increased rapidly in the last decade, the standardized rate being 114 per million in 1923

Table LVII.—Deaths attributed to Tumours not returned as Malignant.—1933.

Part affected.		All Ages.		0–		15–		35–		45–		55–		65–		75–	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Tumours classed with other disease of organ affected.																	
In 137. Prostate		287	—	—	—	—	—	—	—	5	—	45	—	129	—	108	—
Adenoma		272	—	—	—	—	—	—	—	5	—	44	—	120	—	103	—
Fibroadenoma		9	—	—	—	—	—	—	—	—	—	—	—	5	—	4	—
Myoadenoma		6	—	—	—	—	—	—	—	—	—	1	—	4	—	1	—
Tumours not classed with other disease of organ affected.																	
54a and 55a. Female genital organs.																	
Ovary	Cyst	—	269	—	—	—	31	—	31	—	44	—	58	—	52	—	53
	Cystadenoma	—	5	—	—	—	1	—	1	—	1	—	1	—	1	—	—
	Fibroid	—	4	—	—	—	—	—	1	—	1	—	1	—	1	—	—
	Papilloma	—	2	—	—	—	—	—	—	—	—	—	—	—	2	—	—
	Other benign	—	3	—	—	—	—	—	1	—	—	—	2	—	—	—	—
	Nature unstated	—	15	—	—	—	—	—	2	—	1	—	—	—	6	—	6
Uterus	Adenomyoma	—	3	—	—	—	—	—	—	—	1	—	2	—	—	—	—
	Endometrioma	—	12	—	—	—	2	—	6	—	3	—	1	—	—	—	—
	Fibroid	—	389	—	—	—	22	—	107	—	170	—	30	—	31	—	29
	Myoma	—	5	—	—	—	—	—	3	—	1	—	1	—	—	—	—
	Polypus	—	17	—	—	—	1	—	4	—	8	—	4	—	—	—	—
	Other benign	—	4	—	—	—	1	—	1	—	1	—	1	—	—	—	—
	Nature unstated	—	2	—	—	—	—	—	—	—	1	—	1	—	—	—	—
Pelvis	Non-malignant	—	3	—	1	—	—	—	—	—	—	—	1	—	1	—	—
	Nature unstated	—	5	—	—	—	1	—	—	—	—	—	1	—	2	—	1
Vagina	Non-malignant	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Broad ligament	Cyst	—	4	—	—	—	1	—	—	—	2	—	1	—	—	—	—
	Other benign	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—
54b and 55b. Other sites.																	
Brain	Angioma	4	2	—	2	2	—	—	—	1	—	1	—	—	—	—	—
	Astrocytoma	—	7	—	2	—	1	—	1	—	1	—	2	—	—	—	—
	Cyst	23	18	2	4	10	7	3	3	2	3	5	1	1	—	—	—
	Endothelioma, non-malignant	1	3	—	—	—	2	—	—	1	1	—	—	—	—	—	—
	Glioma	149	142	18	15	28	36	27	28	38	33	30	23	7	7	1	—
	Meningioma, non-malignant	5	5	—	—	2	—	2	1	—	2	—	—	1	1	—	1
	Other benign	14	14	—	2	3	2	3	3	3	5	1	1	4	1	—	—
	Nature unstated	441	409	54	33	54	79	77	69	106	94	101	88	37	38	12	8
Pituitary gland	Adenoma	4	9	—	—	2	4	1	—	—	2	1	2	—	—	—	1
	Other benign	2	5	—	1	—	1	—	1	—	1	2	1	—	—	—	—
	Nature unstated	17	20	1	2	6	4	6	4	3	5	1	4	—	1	—	—
Pineal body	Non-malignant	2	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—
Thyroid	Cyst	1	2	—	—	—	—	1	—	—	—	—	1	—	—	—	1
Spinal cord	Glioma	3	2	1	—	—	—	1	1	—	—	—	1	1	—	—	—
	Other benign	3	1	—	—	—	—	—	—	1	—	2	—	—	1	—	—
	Nature unstated	7	8	—	—	—	—	1	1	3	1	3	4	—	2	—	—
Eye	Glioma	1	4	1	4	—	—	—	—	—	—	—	—	—	—	—	—
	Other benign	1	1	—	1	—	—	—	—	1	—	—	—	—	—	—	—
	Nature unstated	1	2	—	1	—	—	—	—	—	—	—	—	1	1	—	—
Ear	Cholesteatoma	3	2	—	—	2	2	—	—	—	—	1	—	—	—	—	—
	Other benign	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Nose	Polypus	9	9	—	1	—	3	2	1	—	—	4	3	2	—	1	1
	Other benign	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
Larynx	Papilloma	4	3	1	2	—	—	—	—	1	1	—	—	1	—	1	—
	Other benign	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
	Nature unstated	4	1	—	—	—	—	—	—	1	—	2	—	1	—	—	1
Mediastinum	Non-malignant	3	2	—	—	—	—	1	1	—	—	1	—	1	1	—	—
	Nature unstated	54	34	—	2	1	1	3	3	6	4	17	13	22	9	5	2

Table LVII.—*continued.*

Part affected.	All Ages.		0–		15–		35–		45–		55–		65–		75–	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Tumours not classed with other disease of organ affected—continued.																
Lung .. .. Non-malignant ..	1	1	—	—	1	—	—	—	—	1	—	—	—	—	—	—
Nature unstated ..	56	16	—	—	1	—	4	2	18	5	19	6	10	3	4	—
Parotid .. .. Mixed tumour ..	6	3	—	—	—	—	1	—	—	—	—	1	3	1	2	1
Other benign ..	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—
Nature unstated ..	3	1	—	—	—	—	—	—	—	—	1	—	1	—	1	1
Œsophagus .. Nature unstated ..	1	5	—	—	—	—	—	—	—	—	—	—	—	1	1	4
Stomach .. Non-malignant ..	2	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—
Nature unstated ..	12	10	—	—	—	—	—	1	1	—	3	1	5	2	3	6
Intestine .. Cyst..	3	1	1	—	—	—	—	1	1	—	1	—	—	—	—	—
Polypus	1	5	—	2	1	1	—	—	—	—	—	1	—	1	—	—
Other benign ..	1	6	—	—	—	2	—	—	—	1	1	1	—	2	—	—
Nature unstated ..	16	19	—	—	—	1	—	—	1	—	2	4	10	6	3	8
Rectum .. .. Papilloma	5	2	—	—	1	—	—	—	—	—	1	1	2	1	1	—
Other benign ..	1	3	—	—	—	—	—	1	—	—	—	1	1	—	—	1
Nature unstated ..	4	—	1	—	—	—	—	—	1	—	1	—	1	—	—	—
Liver .. .. Non-malignant ..	2	3	1	—	—	1	1	—	—	—	—	1	—	1	—	—
Nature unstated ..	2	7	—	—	—	—	1	—	—	—	—	2	1	2	—	3
Pancreas .. Cyst..	5	7	—	—	—	—	—	1	—	4	4	1	1	1	—	—
Other benign ..	1	1	—	—	—	—	—	—	1	1	—	—	—	—	—	—
Nature unstated ..	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Kidney .. .. Non-malignant ..	3	3	1	—	—	—	—	—	—	—	—	1	1	1	1	1
Nature unstated ..	7	16	1	1	—	—	—	1	—	2	4	5	1	2	1	5
Bladder .. .. Papilloma	110	47	—	—	1	—	2	2	19	2	26	6	34	18	28	19
Polypus	2	2	—	—	—	—	—	—	—	—	—	2	—	—	2	—
Nature unstated ..	8	1	—	—	—	—	—	—	—	—	1	—	4	1	3	—
Prostate.. .. Non-malignant ..	3	—	—	—	—	—	—	—	—	—	2	—	1	—	—	—
Nature unstated ..	4	—	—	—	—	—	—	—	—	—	—	—	3	—	1	—
Breast .. .. Adenoma, Cyst-adenoma	1	6	—	—	—	—	—	1	—	1	—	1	—	1	1	2
Cyst..	—	3	—	—	—	—	—	1	—	1	—	—	—	1	—	—
Other benign ..	—	4	—	—	—	—	—	2	—	—	—	1	—	—	—	1
Nature unstated ..	—	2	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Jaw .. .. Non-malignant ..	1	1	—	—	—	—	—	—	—	—	1	—	—	1	—	—
Spine .. .. Non-malignant ..	—	4	—	—	—	1	—	2	—	—	—	1	—	—	—	—
Nature unstated ..	9	10	—	—	—	1	3	2	1	—	3	5	2	2	—	—
Sacrum .. Non-malignant ..	1	3	1	—	—	—	—	—	—	1	—	1	—	1	—	—
Nature unstated ..	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Neck .. .. Non-malignant ..	2	1	1	1	—	—	—	—	1	—	—	—	—	—	—	—
Nature unstated ..	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Thorax .. .. Nature unstated ..	7	1	—	—	1	—	1	—	1	—	1	—	3	—	—	1
Abdomen .. Cyst	—	7	—	1	—	1	—	1	—	2	—	—	—	2	—	—
Other benign ..	1	2	—	—	—	—	1	—	—	1	—	—	—	—	—	1
Nature unstated ..	6	19	—	—	—	—	—	—	—	3	2	—	2	8	2	8
Other sites .. Non-malignant ..	31	21	7	2	3	3	4	5	6	3	7	2	2	2	2	4
Nature unstated ..	7	11	—	1	1	1	1	1	2	2	3	—	—	2	—	4
Site not stated .. Non-malignant ..	3	5	—	—	—	1	—	1	1	1	—	1	1	—	1	1
Total (54 and 55)	1088	1711	92	82	122	215	149	300	222	419	256	295	169	223	78	177
Total, all tumours	1375	1711	92	82	122	215	149	300	227	419	301	295	298	223	186	177
„ benign tumours ..	707	1096	35	42	58	127	51	214	83	301	137	161	193	134	150	117
„ nature unstated ..	668	615	57	40	64	88	98	86	144	118	164	134	105	89	36	60

and 162 in 1933. In 1933 a total of 6,134 deaths was assigned to No. 137, diseases of the prostate, No. 51, cancer of the prostate, and Nos. 54, 55, other or ill defined tumours, and of these deaths 26·6 per cent. were attributed to cancer, 4·8 per cent. to benign tumours and 68·6 per cent. to other conditions, chiefly hypertrophy.

The corresponding figures relating to 1922–24 and 1930–32 were incorrectly stated in the Review for 1932, but the conclusion drawn, that deaths attributed to non-malignant conditions have increased in recent years rather more rapidly than those attributed to cancer, was correct. The proportions calculated on the above basis for 1922–24 are 29·1, 4·4 and 66·5 per cent. respectively.

Deaths assigned to associated causes with "adenoma" of the prostate as a contributory condition, numbered 25, compared with 24 in 1931 and 29 in 1932, and of these 78 deaths 21 were classed to heart diseases, 13 to diabetes, 8 to arterio-sclerosis and 6 to kidney diseases.

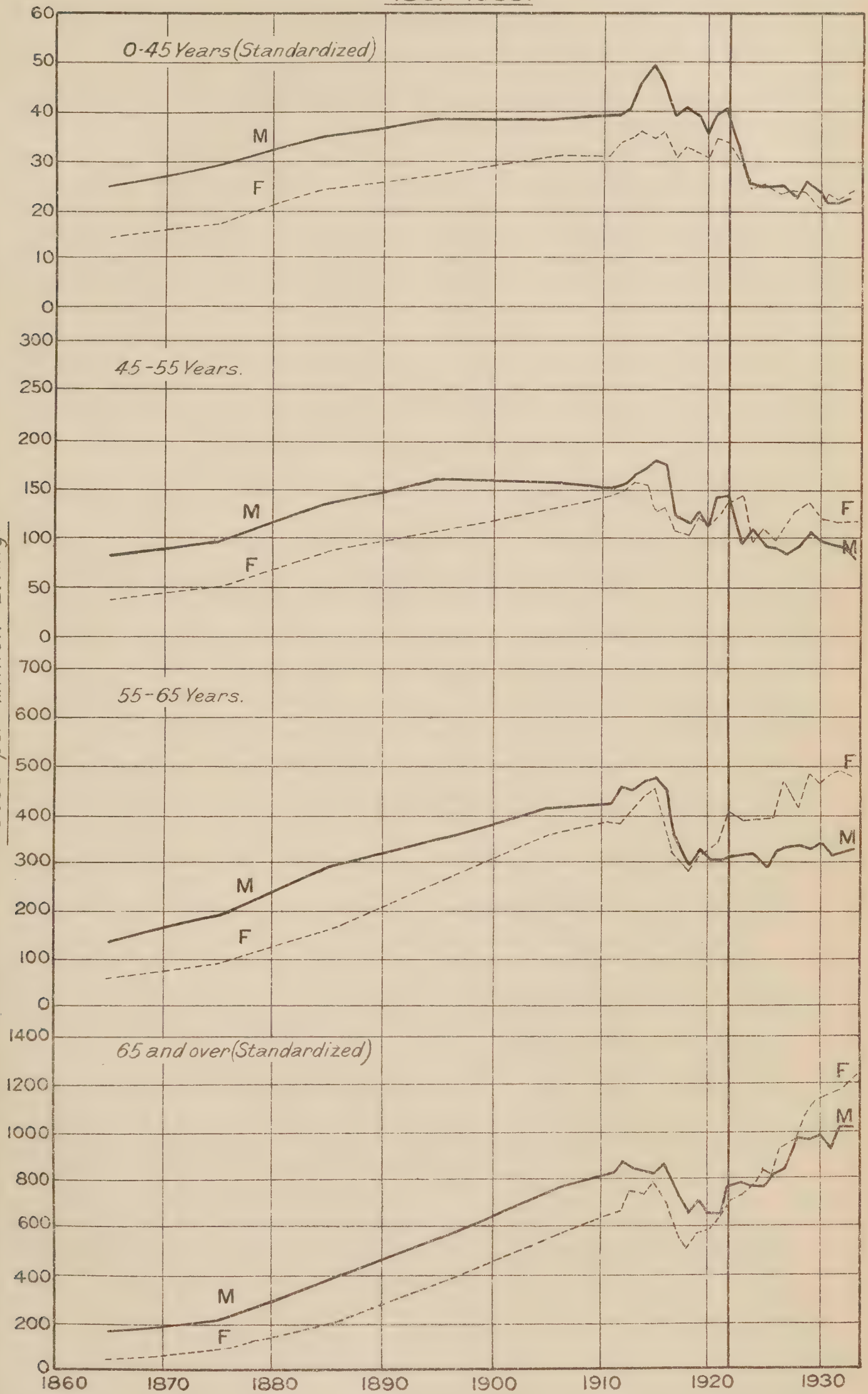
Adenoma of the thyroid is not included in this table, but is classed to No. 66 (*a*), Simple goitre.

Deaths ascribed to pituitary tumour have increased from 7 in 1913 to 57 in 1933. Deaths from tumour of the lung increased from numbers ranging between 11 and 21 during 1912–19 to 83 in 1932 and 74 in 1933. Like lung cancer, which has also increased rapidly (Table LVI), they affect males much more than females. The ratios of malignant to benign tumours of the mediastinum, lung, and abdominal organs suggest that large proportions of those returned as of unknown nature were probably malignant.

59. **Diabetes.**—The deaths allocated to this disease numbered 6,278, 2,460 of males and 3,818 of females, corresponding to standardized death-rates of 92 for males and 114 for females. This rate has been in excess for females in each year from 1923 onwards, whereas before that date excess for males was an invariable rule, though its amount had long been decreasing.

The trend of diabetes mortality since 1861–70 is represented in Diagram 4 for each sex. At ages under 45 male standardized mortality increased until 1891–1900, remained stationary until 1912, and then rapidly increased to 1915. The rates of the next 5 years, which relate to civilians only, were greatly influenced by selection, but from 1920 to 1922 the rate was again rising. The introduction of insulin in 1923 was accompanied by a drop from 41 per million in 1922 to 26 in 1924 and a further gradual fall to the present level of 23 (22 in 1931–32). At ages 45–55 male mortality behaved similarly; it remained stationary, about 160 per million, from 1891–1900 to 1913, fluctuated during 1914–20 and had not quite regained its former level by 1922. The following years witnessed a drop from 143 to a mean level of 88 in 1926–28 and 90 in 1931–33.

DIAGRAM 4 DIABETES MORTALITY IN ENGLAND AND WALES 1861–1933.



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Mortality of females at ages under 45, steadily increased until 1901–10, when the standardized rate was 32 per million, and fluctuated about that level during the next decade. With the use of insulin the rate fell from 34 in 1922 to 25 in 1924 and has remained about that level since. At ages 45–55 the rate was steadily rising up to 1913, then rapidly declined during 1915–18 but increased again almost as quickly in the succeeding years to 1923. The fall which then occurred has not been so well maintained as at the earlier ages; the curve indicates that the introduction of insulin interrupted for several years the upward trend of registered mortality at this age period, just as food restriction and other factors had done in 1915–18.

There is no reason to suppose from the behaviour of the death-rates in the pre-insulin period or from other evidence that the rate of incidence of new cases of diabetes at ages under 55 has undergone any diminution during the past 10 years. On the contrary there is reason to believe that it has increased to some extent. Assuming a constant incidence rate, the deaths which would have occurred at ages under 55, had no change in therapy taken place, may be calculated by applying the 1920–22 death-rates to the population at the corresponding ages in the year in question. These expected deaths of both sexes in the years 1931, 1932 and 1933 are compared below with the actual deaths registered.

		Under 45	45–55	Under 55	Deficiency under 55
1931	Expected ..	1,112	630	1,742	
	Actual.. ..	702	540	1,242	500
1932	Expected ..	1,116	634	1,750	
	Actual.. ..	691	527	1,218	532
1933	Expected ..	1,117	637	1,754	
	Actual.. ..	723	501	1,224	530

In each year there has been a deficiency of about 500 deaths from the calculated number, and it is reasonable to conclude that these represent minimal estimates of the deaths which would have occurred at ages under 55 under pre-insulin conditions but which were postponed by insulin either (*a*) to some age over 55, or (*b*) to some age under 55 with assignment of death to some cause other then diabetes. With regard to the latter eventuality, the death of a diabetic who has been receiving insulin will usually have mention of diabetes as a contributory cause and will be assigned to diabetes in classification except when the associated cause is an infective condition, acute intercurrent disease or general disease such as cancer. Prolongation of life of young adults means a greater risk of dying before 55 from those causes taking precedence over diabetes in classification, and some fraction of the 500 deaths must be so accounted for, but these are probably more than offset by an increased incidence which the basis of calculation has not allowed for.

If this is so, the number of deaths in defect, 530 in 1933, can be regarded as the excess of deaths postponed from the age group 45–55 to the group 10 years older over the deaths postponed from the group 10 years younger to the group 45–55. The expected deaths at 45–55 numbered 637, of which 530 or 83 per cent. were on this assumption postponed to an age group 10 years older, and from this it follows that the average lengthening of life of the diabetics who in the pre-insulin period would have died before 55 has been about 8 years. This estimate is an average for all diabetics in the population who would have died before 55, whether insulin treated or not, and it is similar to an estimate reached from clinical experience in the U.S.A.*

At ages 55–65 mortality steadily increased up to 1915 for both sexes, declined abruptly in the period of food restriction, and was again rising from 1920 to 1922 (Diagram 4). From 1923 onwards the male rate at 55–65 has not appreciably changed whilst the female rate has continued to increase. Standardized male mortality at ages over 65, which had not regained the 1911–14 level by 1922, remained stationary until 1925 and then rose rapidly to 1928, with a further increase in 1932. The rise in the corresponding female rate has been sustained with few interruptions since 1918.

The reasons for the continuous increase in death-rates attributed to the senile form of diabetes, due in part to rising incidence perhaps but in greater part to increasing recognition of the condition and mention of it on death certificates, has been frequently commented upon. Having regard to (*a*) the steep upward trend of registered diabetes mortality at ages over 55 from 1861–70 to 1915, when the period of food restriction resulted in a profound and prolonged interruption in this trend, (*b*) the transfer of deaths from earlier ages owing to postponement of the fatal issue by insulin therapy, and (*c*) the fact that for various reasons the new therapy is less frequently applied to diabetics of advanced age, it is not surprising that registered mortality at ages over 65 continues to increase. It can be shown that, if the death-rates at 55–65, 65–75 and over 75 had increased year by year since 1920–22 by the same mean annual increments as were operative during the undisturbed period from 1901–10 to 1915, the expected deaths at ages over 55 in 1933 would be 4,487. The actual deaths registered numbered 5,054, an excess of 567 which is approximately equal to the deficiency calculated above at ages under 55. The recent trend of the mortality rates could therefore be adequately explained by a transfer of deaths up the age scale (sufficient to postpone about 500 deaths in each year from before 55 to after that age), superimposed upon a resumption since 1921 of the pre-1915 trend of mortality rates at the various ages.

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* Joslin, Dublin and Marks. Amer. J. of Med. Sci. 1934, CLXXXVII, 434.

Table LVIII.—Mortality from Diabetes in 1920–22 and in subsequent years.

	Standardized Rates.			0–	15–	25–	35–	45–	55–	65–	75 and up
	All ages	0–55	55 and up								
	DEATH-RATES PER MILLION LIVING.										
Males :—											
1920–22 ..	93·7	47·9	477·5	14	42	60	69	133	309	661	772
1931 ..	88·1	29·5	580·3	12	22	30	38	97	315	821	1,161
1932 ..	92·4	28·9	625·6	10	21	30	45	93	320	897	1,310
1933 ..	92·3	28·5	628·2	13	26	30	36	80	325	888	1,326
Females :—											
1920–22 ..	90·1	43·1	483·9	16	35	48	62	124	355	656	632
1931 ..	110·9	33·4	762·0	11	26	31	45	121	473	1,097	1,218
1932 ..	112·4	32·5	783·3	13	20	29	46	118	485	1,143	1,219
1933 ..	114·3	33·5	793·0	12	25	30	48	118	470	1,178	1,275
	MORTALITY OF LATER YEARS PER CENT. OF THAT IN 1920–22.										
Males :—											
1923 ..	96	79	110	79	79	80	87	74	104	113	114
1924 ..	92	72	108	64	69	63	75	83	104	105	122
1925 ..	87	67	104	79	52	72	62	70	93	106	120
1926 ..	92	68	112	93	67	60	70	68	105	112	124
1927 ..	94	67	116	79	74	68	58	63	107	116	133
1928 ..	97	63	126	93	60	55	55	68	107	136	140
1929 ..	101	73	125	86	60	60	90	79	106	130	150
1930 ..	99	65	128	71	57	63	59	74	109	130	154
1931 ..	94	62	122	86	52	50	55	73	102	124	150
1932 ..	99	60	131	71	50	50	65	70	104	136	170
1933 ..	99	59	132	93	62	50	52	60	105	134	172
Females :—											
1923 ..	104	95	112	69	86	92	95	115	110	112	116
1924 ..	98	75	116	69	80	67	76	80	110	118	116
1925 ..	104	80	122	69	86	67	85	90	111	131	128
1926 ..	101	74	121	56	71	73	82	80	113	127	128
1927 ..	112	76	139	69	71	67	73	91	131	135	173
1928 ..	112	79	138	69	74	69	66	102	118	147	163
1929 ..	123	81	155	69	63	65	84	106	135	157	196
1930 ..	119	72	155	69	51	56	71	99	131	165	193
1931 ..	123	77	157	69	74	65	73	98	133	167	193
1932 ..	125	75	162	81	57	60	74	95	137	174	193
1933 ..	127	78	164	75	71	63	77	95	132	180	202

71(*a*). **Pernicious Anæmia.**—The progress of mortality since 1927, when a new and effective treatment came into use for this disease is revealed in Table LIX, where annual rates at various ages are expressed in terms of the corresponding rates in the triennium preceding 1927. The actual rates in greater detail of age in each year from 1922 to 1931 were shown in the Review for 1931, Table XLVIII. In 1933 the standardized rates, which had been increasing since the sudden fall registered in 1928, were below those of 1932, an improvement being noticeable at each separate age except 25–45. For males the greatest relative decline in mortality has occurred at ages 25–45, and for females at ages under 25.

As for diabetes, the new remedies are in general only effective in prolonging life so long as treatment is continued, and unless the patient eventually dies of some acute or general disease to which precedence is given in the classification of deaths due to joint causes, or without mention being made on the certificate of the

Table LIX.—Mortality from Pernicious Anæmia per Million living in 1931, 1932 and 1933, and per cent. of the rate for 1924–26 in each year 1927 to 1933.

	MALES.						FEMALES.					
	All Ages*	0–	25–	45–	65–	75 and up	All Ages*	0–	25–	45–	65–	75 and up
MORTALITY PER MILLION LIVING.												
1931 ..	34	3	13	98	311	301	43	5	27	134	328	231
1932 ..	39	5	13	111	368	339	49	5	29	149	379	235
1933 ..	35	3	13	104	317	322	46	4	30	130	367	326
MORTALITY PER CENT. OF THAT IN 1924–26.												
1927 ..	98	84	91	96	106	114	97	86	90	98	98	109
1928 ..	65	102	59	55	77	92	67	77	56	64	78	91
1929 ..	70	78	59	58	86	133	67	66	53	64	84	109
1930 ..	76	74	69	71	85	121	72	45	63	68	84	138
1931 ..	74	70	54	64	89	149	74	58	58	74	91	112
1932 ..	85	106	53	72	106	167	84	56	61	83	106	162
1933 ..	76	69	56	68	91	159	79	47	64	72	102	158

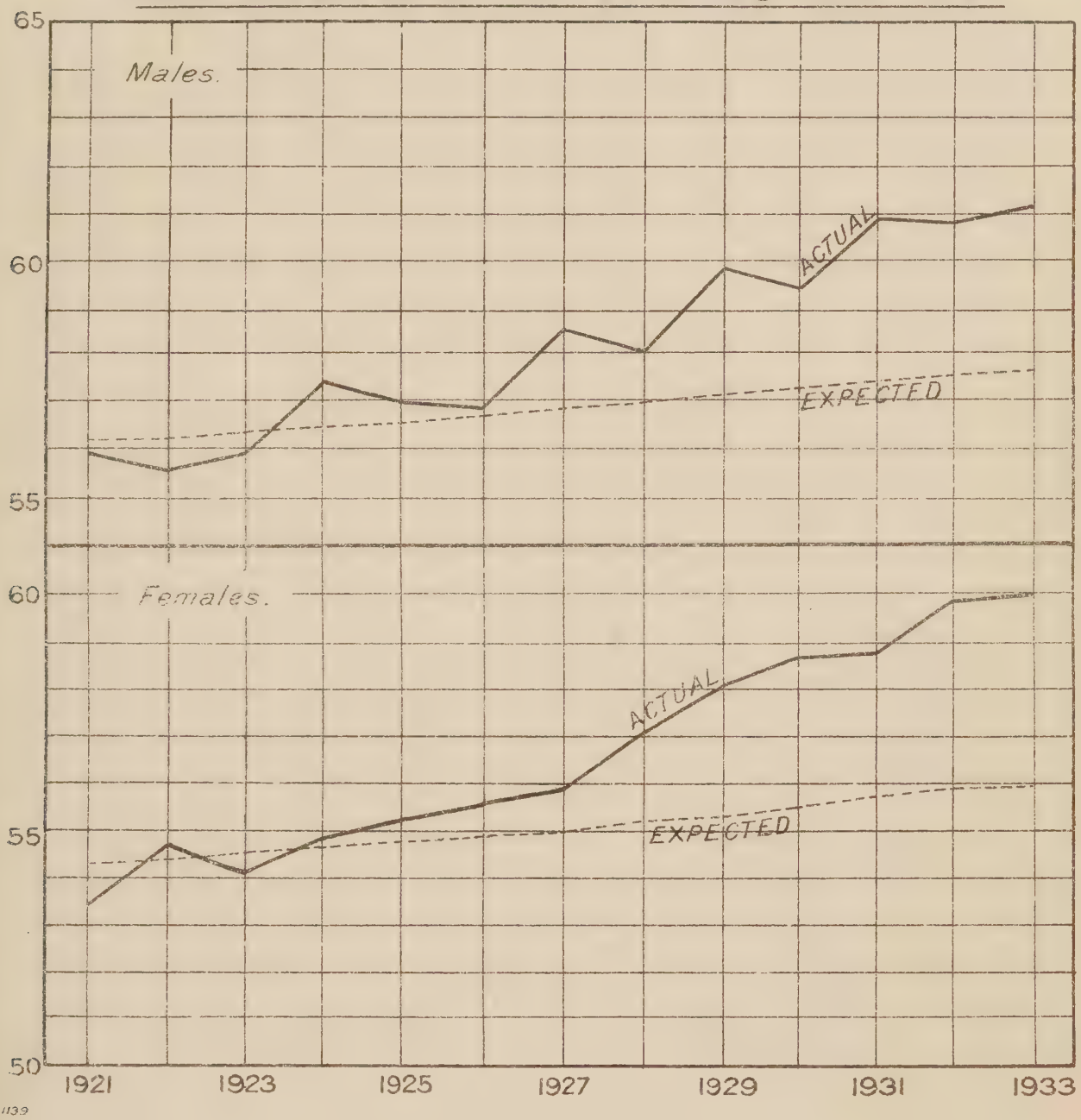
* Standardized.

pernicious anæmia, the expected effect on the mortality statistics would be a temporary reduction in annual deaths at each age, followed by a gradual return to the original total with a higher average age distribution. This assumes a constant incidence of new cases, whereas there is reason to believe that the number of recognised cases of pernicious anæmia and other blood diseases is increasing. The total deaths registered in the 8 years 1926 to 1933 have numbered 2,780, 2,655, 1,854, 1,955, 2,150, 2,226, 2,591, 2,428, which indicates a return by 1932 almost to the 1927 level, and this suggests that any absolute reduction in the fatality of pernicious anæmia brought about by the new remedies has been balanced by an increased incidence or recognition of the disease.

Comparison of the age distribution of the 2,585 deaths in 1925 with that of the 2,591 deaths in 1932 reveals a transfer of deaths up the age scale during the interval, resulting in a decrease of 318 deaths at ages under 55 and an increase of 331 at ages over 65. The average lengthening of life of which this is a sign can be estimated by applying the 1921–26 death-rates to the population at each age in each of the following years, finding from the resulting calculated deaths the expected mean age at death, and comparing these values with the actual mean ages at death from pernicious anæmia in the corresponding years.

Table LX and Diagram 5 indicate that from 1926 to 1933 the rise in actual mean age was greater than the expected rise by 3·3 years for males and by 3·5 years for females. Provided, therefore,

DIAGRAM 5. PERNICIOUS ANÆMIA: MEAN AGE AT DEATH, ACTUAL, AND EXPECTED AT 1921–26 RATES. 1921–1933.



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that the age-distribution of incidence has not changed in the interval there has been a mean lengthening of life since 1926 for the whole population of pernicious anæmia cases, however treated and of all ages amounting to 3 to $3\frac{1}{2}$ years.

Table LX—Pernicious Anæmia—Actual and Calculated Mean Ages at Death, 1921 to 1933.

	Males.			Females.		
	Actual.	Calculated.	Difference.	Actual.	Calculated.	Difference.
1921	55·9	56·2	−0·3	53·5	54·3	−0·8
1922	55·6	56·2	−0·6	54·7	54·4	+0·3
1923	55·9	56·3	−0·4	54–2	54·5	−0·3
1924	57·4	56·4	+1·0	54·8	54·6	+0·2
1925	57·0	56·5	+0·5	55·2	54·6	+0·6
1926	56·9	56·7	+0·2	55·5	54·9	+0·6
1927	58·5	56·8	+1·7	55·9	54·9	+1·0
1928	58·0	57·0	+1·0	57·1	55·1	+2·0
1929	59·8	57·1	+2·7	58·1	55·2	+2·9
1930	59·4	57·2	+2·2	58·6	55·9	+2·7
1931	60·9	57·4	+3·5	58·7	55·7	+3·0
1932	60·8	57·5	+3·3	59·8	55·8	+4·0
1933	61·1	57·6	+3·5	60·0	55·9	+4·1

The international group No. 71a, with heading "Pernicious Anæmia," on which all these statistics are based, includes also aplastic, essential or hæmolytic anæmias, Addison's anæmia and "progressive" or "profound" anæmias whose cause cannot be ascertained. At ages under 15 when true pernicious anæmia is unusual, these varieties account for a considerable proportion of the deaths assigned to this group.

Agranulocytosis (Agranulocytic Angina).—Although it was possible in 1931 to collect from the literature of this disease records of 225 deaths* in various countries, only 12 deaths had been registered in England and Wales as due to agranulocytic angina or agranulocytosis, alone or in association with other causes, up to the end of 1932. Of these 2 occurred in 1930, 3 in 1931 and 7 in 1932† In 1933 31 deaths, and in 1934 39, were so attributed, the classification being in some instances to other causes such as pulmonary tuberculosis or lobar pneumonia with agranulocytosis as a contributory or associated cause.

* "Journal of American Medical Association, 1931, XCVII, 1757. The number of cases was 328. Over 1,000 cases had been reported by the end of 1932 from various countries.

† Two deaths also are recorded in the literature which on certification were not attributed to the disease, one in 1928, a female aged 50, the other in 1931, a female child aged 7.

Pending a clearer definition of the disease as an established clinical entity, the deaths were classed until the end of 1934 to sub-groups 115(3) or 115(4) when it was described as angina, or with the unclassified anæmias in No. 71 *b*(2) when described as agranulocytosis. Since the two descriptions are now regarded as synonyms*, the angina being secondary to the blood condition, and since the latter is not characterised by " anæmia " in the usually accepted meaning of the term but by an aleukæmia affecting the granular leucocytes, from 1935 onwards a new subgroup to comprise both descriptions, with title No. 72 *b*(2) aleukæmia (agranulocytosis) will be introduced into Tables 6, 7, 21 and 23, and No. 72*b* aleukæmia (lymphadenoma) will be designated 72 *b*(1).

Table LXI classifies the 82 deaths attributed wholly or in part to the condition in England and Wales during 1930–34 by sex and age, with distinction of those described as (AA) agranulocytic angina or agranulocytosis with mention of a throat lesion, and those described as (A) agranulocytosis without mention of a throat lesion.

Table LXI.—Agranulocytosis : Deaths attributed to the Condition (alone or in association with Other Causes), by Sex and Age, 1930-1934.

A—Agranulocytosis without mention of a throat lesion.
AA—Agranulocytic angina, or agranulocytosis with throat lesion.

	1930.				1931.				1932.				1933.				1934.				Total.	
	M.		F.		M.		F.		M.		F.		M.		F.		M.		F.		M.	F.
	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.		
0– ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1– ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	2
5– ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
10– ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1
15– ..	—	—	—	—	—	—	1	—	—	—	—	—	—	1	1	1	—	2	—	2	3	5
20– ..	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	1	—	2	—	—	4	1
25– ..	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	1	1	—	—	3	1	6
30– ..	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	3
35– ..	—	—	—	1	—	—	1	—	—	—	—	—	—	1	—	—	—	—	1	3	1	6
40– ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—
45– ..	—	—	1	—	—	1	1	—	1	—	—	3	1	—	—	2	4	6				
50– ..	—	1	—	—	—	—	—	—	—	—	1	3	—	1	—	1	1	6				
55– ..	—	—	—	—	—	—	—	1	—	—	1	1	1	1	2	1	2	6				
60– ..	—	—	—	—	—	—	—	1	—	—	1	2	—	1	—	2	1	6				
65– ..	—	—	—	—	—	—	—	—	—	1	—	3	—	1	—	2	2	5				
70– ..	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	4	—	5				
75– ..	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	1	1				
80– ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1				
All ages	—	2	1	2	1	1	3	2	1	4	7	19	3	10	3	23	21	61				

Deaths of females totalled 61, and of males 21. The distribution in the successive decades of age was 3, 9, 12, 10, 11, 15, 14, 7, 1.

Of the 19 without mention of a throat lesion 8 were attributed to agranulocytosis without qualification, and the remainder to " agranulocytosis " with mention of anæmia (3), septicæmia or

* Reports on Public Health and Medical Subjects, Ministry of Health No. 76, 1935.

pyæmia (2), pneumonia and septicæmia (2), pneumonia (1), bronchitis (1), hæmoptysis (1), cerebral hæmorrhage (1). Of the 63 with mention of a throat lesion 33 were attributed to " agranulocytic angina " without qualification, 9 to agranulocytosis (or " agranulocytic anæmia ") with an associated throat lesion variously described, and the remainder to agranulocytic angina with mention also of septicæmia (4), pneumonia or œdema of lungs (11), myocardial degeneration (2), uræmia (1), phlebitis (1), nephritis (1), phthisis (1).

The regional distribution was as follows: Greater London 29, remainder of South East 16, South-West 10, Lancashire 8, Yorkshire West Riding 6, Remainder of North Region 3, Birmingham 7, East 2, Wales 1.

Table LXII.—Deaths from or associated with Alcoholism; Death-rate per Million from the Combined Causes and from Cirrhosis of Liver not returned as Alcoholic, 1921-1933.

	Number of Deaths.										Death rate per million persons.	
	Alcoholism No. 75.		Returned as connected with alcoholism.									
			Cirrhosis of liver 124 (a)		Heart diseases 90–95.		Violent deaths 163–198.		Other causes.		Returned as alcoholism or associated therewith.	Cirrhosis of liver not returned as alcoholic 124 (b).
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
1921	127	55	100	54	41	17	61	11	125	56	17	47
1922	117	47	103	47	41	14	52	16	125	59	16	46
1923	104	47	98	54	22	12	46	16	106	57	15	42
1924	94	33	90	57	36	8	44	7	120	53	14	42
1925	95	55	87	49	25	19	34	6	90	48	13	44
1926	76	39	82	50	31	20	36	17	90	58	13	44
1927	84	24	162	101	40	22	37	14	176	92	19	41
1928	74	34	210	110	54	34	30	10	205	102	22	40
1929	85	49	175	83	69	38	41	11	206	75	21	38
1930	49	45	144	71	46	25	35	10	147	75	16	36
1931	40	41	162	99	45	35	24	2	136	45	16	34
1932	61	34	115	62	42	19	18	4	99	45	12	32
1933	43	30	115	77	52	19	24	10	79	35	12	26

75. **Alcoholism.**—This heading in the International List of causes of death excludes organic disease attributed to alcoholism, so, in order to obtain as complete information as possible with regard to mortality from over-indulgence in alcohol, all the deaths in certification of which any mention of alcohol appears are assembled in Table LXIII.

Although the conditions of medical certification can scarcely be expected to admit of a full and reliable return of deaths due, in part or altogether, to alcoholism, experience has shown that the figures in Table LXIII and its predecessors have in the past fluctuated in remarkable harmony with other indices of alcoholic intemperance, and are thus not without value as indicative of at least the relative extent of this form of mortality in different years, even though they

Table LXIII.—Deaths from or connected with Alcoholism—1933.

	All Ages.		Under 25		25–		35–		45–		55–		65–		75–	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
75. Deaths attributed solely to alcoholism	43	30	—	—	6	1	7	5	7	10	12	8	10	6	1	—
Deaths attributed to other causes in conjunction with alcoholism—																
11. Influenza	8	1	—	—	—	—	2	—	4	—	2	—	—	1	—	—
15. Erysipelas	2	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—
23. Tuberculosis of the respiratory system	1	1	—	—	—	—	—	—	1	1	—	—	—	—	—	—
34. Syphilis	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
45–53. Cancer	5	1	—	—	—	—	—	—	2	1	2	—	1	—	—	—
54 (*a*) Fibroid of uterus	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—
57–2. Osteo-arthritis	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—
59. Diabetes	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
60. Scorbutus	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—
70 (*a*) Purpura hæmorrhagica ..	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
71 (*a*) Aplastic anæmia	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—
76. Paraldehyde poisoning ..	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
80. Tabes dorsalis	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
82. Cerebral hæmorrhage, apoplexy, etc.	5	1	—	—	—	—	2	—	2	—	—	—	1	1	—	—
84 (*b*) Other forms of insanity ..	2	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—
85. Epilepsy	2	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—
87 (*b*) Neuritis, neuralgia ..	5	5	—	—	—	—	1	2	3	2	1	1	—	—	—	—
92. Valvular disease of heart ..	8	3	—	—	—	—	1	—	2	—	2	—	3	1	—	2
93 (*b* : 1) Fatty heart	11	3	—	—	1	—	3	1	3	2	4	—	—	—	—	—
93 (*b* : 2) Cardiovascular degeneration	3	1	—	—	—	—	—	—	—	—	—	1	3	—	—	—
93 (*b* : 3) Other or unspecified myocardial disease	18	8	—	—	2	—	1	2	3	4	5	—	4	1	3	1
93 (*c*) Myocarditis not distinguished as acute or chronic ..	8	1	—	—	—	—	1	1	2	—	4	—	1	—	—	—
94. Diseases of the coronary arteries	3	1	—	—	—	—	—	—	—	—	1	—	2	1	—	—
95 (*b* : 2) Heart disease (undefined)..	1	2	—	—	—	—	—	1	—	—	1	1	—	—	—	—
97. Arterio-sclerosis	5	2	—	—	—	—	—	—	—	—	2	—	3	1	—	1
106. Bronchitis	2	2	—	—	—	—	—	—	—	—	—	1	1	1	1	—
107. Broncho-pneumonia ..	4	4	—	—	—	—	—	—	2	1	1	1	—	2	1	—
108. Lobar pneumonia	9	1	—	—	1	—	4	—	1	—	3	1	—	—	—	—
110 (2) Pleurisy	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
112. Asthma	1	1	—	—	—	—	—	1	—	—	—	—	1	—	—	—
115 (3) Diseases of the tonsils ..	2	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—
117. Ulcer of the stomach or duodenum	5	—	—	—	—	—	1	—	2	—	2	—	—	—	—	—
118 (1) Inflammation of the stomach	5	5	—	—	—	—	1	—	4	—	—	2	—	3	—	—
119–120. Diarrhœa and enteritis ..	1	1	—	—	—	—	—	—	—	1	1	—	—	—	—	—
122 (*a* : 2) Femoral hernia	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—
122 (*b*) Intestinal obstruction ..	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—
124 (*a*) Cirrhosis of the liver ..	115	77	—	—	2	—	7	7	31	20	37	29	31	15	7	6
130–131. Nephritis	7	3	—	—	—	—	2	—	3	1	1	1	—	1	1	—
133 (*a*) Pyonephrosis	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
133 (*b*) Cystic kidney	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—
152 (1) Cellulitis of back	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
163–171. Suicide	3	3	—	—	—	—	—	2	2	1	1	—	—	—	—	—
183. Accidental drowning ..	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
186 (pt.) Injury by fall	11	5	—	—	—	—	1	—	1	2	4	2	4	1	1	—
186 (pt.) Injury by crushing (vehicles, railway, etc.)	3	—	—	—	1	—	—	—	2	—	—	—	—	—	—	—
Other violence	6	2	—	—	—	—	4	—	—	—	1	1	1	1	—	—
TOTAL ..	313	171	1	—	15	1	42	23	83	49	89	49	68	39	15	10

cannot be taken as measuring it absolutely. During the half century prior to 1926 the mortality rates derived from such tabulations fluctuated in close correspondence with the records of consumption of alcohol (*see* Diagram II in Review for 1929).

After 1926 the change in the form of the medical certificate produced a temporary disturbance, consisting, as Table LXII indicates, in a sudden increase in deaths attributed to various causes with mention of alcoholism. Violent deaths with associated

alcoholism were unaffected, numbering 53, 51, 40, 52, 45, in the five years from 1926 to 1930, and then falling. Deaths attributed to heart diseases with mention of alcoholism increased from 51 in 1926 to 107 in 1929, but in more recent years have fluctuated about 70. The death-rate per million due to cirrhosis of the liver with mention of alcohol increased from 3 in 1926 to 8 in 1928, and has since declined to 4 in 1932 and 5 in 1933 (Table 7), whereas the rate for cirrhosis without mention of alcohol has declined continually from 44 in 1926 to 26 in 1933. Deaths attributed to causes other than violence, heart disease or cirrhosis of the liver, with mention of alcoholism, increased from 148 in 1926 to 281 in 1929, but have rapidly declined since to 114 in 1933.

The number of deaths attributed solely to alcoholism without mention of other causes, 73, is the lowest recorded.

82. **Cerebral Hæmorrhage, Apoplexy, etc.**—The revised form of the International List (1929) in use since 1931 combines in one group, No. 82, the causes of death which constituted No. 74, cerebral hæmorrhage, apoplexy, etc., No. 75, paralysis of unstated origin (mostly hemiplegia), and No. 83, cerebral softening, in the former classification. The last two groups are of diminishing importance, their contributions forming 4·5 and 1·0 per cent. respectively of the total in 1933, compared with 7·9 and 3·1 per cent. respectively in 1921.

The deaths assigned to this heading in 1933 numbered 25,720 (males 11,215, females 14,505). The standardized rates, 404 per million for males and 399 for females, were the lowest recorded. The true frequency of these causes of death since 1926 is somewhat masked by an increasing tendency, encouraged by the introduction in 1927 of the new form of medical certificate, to state the disease causing the hæmorrhage, which has resulted in a transfer of deaths from cerebral hæmorrhage to arterio-sclerosis, myocardial disease and chronic nephritis, three of the chief diseases with which cerebral hæmorrhage is most frequently associated in the certification of causes of death. It is difficult to estimate the extent of the transfer to myocardial disease and chronic nephritis, but any vitiation of comparability with past records in respect of arterio-sclerosis can to a great extent be overcome by adding the deaths from cerebral vascular lesions associated with arterio-sclerosis, No. 97 (1) and (2), separately tabulated since 1921 (as 91*b*: 1 in the 1921–30 classification) to those from cerebral hæmorrhage without statement of cause.

The crude death-rate from the combined headings (Nos. 82 and 97 (1) and (2)) was 903 for males and 1,005 for females. When standardized, however, to eliminate the effect of the increasing age of the population, the male rate of 628 and the female rate of 576 per million are remarkably close to the rates of 1921, namely, 640 for males and 592 for females.

90–95. **Heart Diseases.**—The number of deaths allocated to this cause, 108,087, 51,412 of males and 56,675 of females, was as usual larger than for any other item in the list of causes.

These numbers are equal to crude death-rates per million of 2,656 for males and 2,700 for females, which are the highest recorded for each sex during the present century. When standardized, the revised rates are considerably reduced to 1,896 for males and 1,616 for females, but still remain in this form the highest in any year for males and in any year except 1929 for females (Table 8).

As pointed out in previous Reviews the recent increase of crude mortality (Table 7) from heart diseases is due, among other causes, to the increasing age of the population and to rapid increase of the record of myocardial degeneration in certification of the deaths of old people. Table LXIV shows how the rates quoted above for 1933 have been affected by these influences, and what, but for them, would have been the course of recent mortality from diseases of the heart. This has been done by ascertaining and deducting

Table LXIV.—Deaths in Standard Million from Heart Diseases at all ages, and from senile myocarditis at ages over 65 in 1921 and 1931-33 ; also the mortality in each year 1922-33 per cent. of that in 1921.

	Males.			Females.		
	All Heart Diseases.	" Senile Myo-carditis " (*see* text).	Col. 1 less col. 2.	All Heart Diseases.	" Senile Myo-carditis " (*see* text).	Col. 4 less col. 5.
	(1)	(2)	(3)	(4)	(5)	(6)
1921 ..	1,203	154	1,049	1,107	145	962
1931 ..	1,845	746	1,099	1,592	646	946
1932 ..	1,848	779	1,069	1,560	661	899
1933 ..	1,896	818	1,078	1,616	705	911
	Rates for subsequent years per cent. of those for 1921.					
1922 ..	108	129	105	110	129	107
1923 ..	101	136	95	102	134	97
1924 ..	105	165	97	107	158	99
1925 ..	110	203	96	110	192	98
1926 ..	108	219	92	107	210	92
1927 ..	117	259	97	118	248	98
1928 ..	123	296	97	122	285	97
1929 ..	153	450	109	150	427	108
1930 ..	142	421	101	134	388	96
1931 ..	153	484	105	144	446	98
1932 ..	154	506	102	141	456	93
1933 ..	158	531	103	146	486	95

from the standardized death-rate from all heart diseases (Table 8) that portion of it for which chronic myocardial disease (other than fatty heart) at ages over 65 was responsible in each year 1921–33, that is to say, the deaths at this age in the standard million derived from the three groups 93*b* (2), 93 (*b*) (3) and 93 (*c*), corresponding to No. 90 (7) prior to 1931. The rates for the years 1922 to 1930 were shown in detail in Table L of the Review for 1931.

The crude death-rate from heart disease has increased since 1921 by 89 per cent., but the standardized rate has increased by 58 per cent. for males and 46 per cent. for females. When further allowance is made for the disturbing influences mentioned above, the increase is seen to have been only 3 per cent. for males and there has been a decrease of 5 per cent. for females.

Table LXIV also shows how rapid has been the increase for each sex of mortality ascribed to senile myocarditis, the rates for 1933 being about five times those of 1921. Its contribution to total heart disease mortality has increased from 13 per cent. in 1921 to 46 per cent. in 1933. Another change in the medical terminology of heart disease is reflected in the rise in the standardized death-rate attributed to "disordered action of the heart," now separately classified in the International List as group No. 95 (*a*), from 6 per million for each sex in 1919 to 37 for males and 46 for females in 1933. This increase is doubtless mainly at the expense of "heart disease (undefined)" for which the standardized rates have fallen since 1922 from 271 to 78 for males and from 250 to 73 for females.

The progressive rise since 1920, commented on in previous Reviews, in the standardized mortality assigned to diseases of the coronary arteries and angina pectoris, No. 94, continued in 1933. For males this rate has risen from 32 in 1920 to 224, and for females from 13 to 80. Part of this has been due to the transfer, since mid-1927, of deaths due to atheroma and sclerosis of the coronary arteries from the arterio-sclerosis group, as pointed out in the Review for 1928 (p. 100), but the increase since 1928, more than doubling the rate for each sex in 5 years, represents a real change in the frequency with which death is attributed to coronary disease. Comparison of the death rates per million at various ages, in 1928 and 1933 is made below.

		0–	35–	45–	55–	65–	75 & up
Males	1928 ..	2	39	168	492	1,022	1,264
	1933 ..	2	71	391	1,027	2,249	3,171
Females	1928 ..	0	7	34	143	414	624
	1933 ..	1	18	80	313	898	1,618

The increase in the short space of 5 years amounts to 130 per cent. at ages 45–55, 110 to 120 per cent. between 55 and 75, and over 150 per cent. at ages over 75.

104–114. **Diseases of the Respiratory System.**—The total number of deaths allocated to these diseases was 56,240, or 1,432 more than

in 1932. The standardized death-rate for males, 1,442 per million, is the lowest recorded, save in 1930 and 1932, and the rate for females, 1,043, is lower than in any year except 1930 (Table 8). The March quarter was responsible for 47 per cent. of the deaths, compared with 44 in 1932 and 47 in 1931 (*see* Review for 1931, Table LI). The remarkably low respiratory mortality in February and March, having regard to the very high influenza death-rate in January and February, is revealed in Table LXXXIX, and also below.

The seasonal deaths assigned to respiratory diseases, without mention of influenza, and from influenza with and without mention of respiratory complications, may usefully be compared with the corresponding figures for mid-1926 to mid-1927, a year which suffered almost the same influenza mortality as 1932–33, and for mid-1929 to mid-1930, a year of low influenza prevalence.

	Influenza						Diseases of respiratory system.		
	without respiratory complications.			with respiratory complications.					
	1926–7	1929–30	1932–3	1926–7	1929–30	1932–3	1926–7	1929–30	1932–3
July ..	114	98	78	120	126	67	2,719	3,042	2,264
August ..	76	87	58	82	81	56	2,263	2,436	2,040
September..	104	81	75	77	77	67	2,424	2,443	2,098
October ..	212	141	150	245	212	232	4,333	3,590	3,353
November ..	297	159	177	381	351	212	6,071	4,815	3,630
December ..	252	196	385	378	318	854	7,643	4,920	5,769
January ..	1,130	233	2,560	2,868	389	8,942	12,555	5,881	12,507
February ..	2,558	232	1,701	6,871	532	5,434	16,160	6,601	8,619
March ..	1,374	257	429	3,143	565	783	9,482	7,255	5,332
April ..	383	204	236	565	348	347	5,577	5,073	4,076
May ..	199	142	136	285	228	162	4,674	4,072	3,085
June ..	153	89	74	161	111	99	3,846	2,908	2,583

The 1927 epidemic reached its maximum in February, whereas that of 1933 produced most deaths in January. The March quarter deaths were as follows :—

	1927.	1930.	1933.
Influenza without respiratory complications	5,062	722	4,690
Influenza with respiratory complications	12,882	1,486	15,159
Respiratory disease ..	38,197	19,737	26,458

A more complete mention on the death certificate of influenza as the cause of respiratory deaths in 1933 than in 1927 is suggested by these figures, but the total excess of deaths from respiratory disease, with or without associated influenza, over the number in 1930 was 20,394 in 1933, compared with 29,856 in 1927. It is also noticeable that although deaths from respiratory disease, without associated influenza, during the epidemic period from December 1932 to February 1933 exceeded those of the corresponding

months of the healthy winter of 1929–30, very low levels of mortality from this cause were reached in the months just preceding and following this period.

The decline in pneumonia mortality rates at various ages in recent years is indicated in Table LXV. The three years 1922, 1927 and 1933, which are separated for comparison as influenza years, were characterised by almost the same degree of influenza mortality, the total deaths registered from that cause being 21,498 22,263 and 22,890 respectively. At each age except 5–15 and over 75 these years show a progressive decline in pneumonia rates, and this is also evident at every age when the normal years 1925 and 1930 are compared.

Table LXV.—Pneumonia (All forms): Death rates per Million living at various ages in several years from 1911-20 to 1933.

—	1911–20.	Normal years		Influenza years			1933 per cent. of 1911–20.
		1925.	1930.	1922.	1927.	1933.	
Males—							
0– ..	5,497	4,808	3,318	6,180	5,265	3,696	67
5– ..	273	204	168	186	226	169	62
15– ..	374	213	172	240	212	170	45
25– ..	605	349	288	428	321	255	42
35– ..	838	727	612	749	677	553	66
45– ..	1,262	1,030	975	1,031	984	928	74
55– ..	1,985	1,575	1,335	1,699	1,464	1,320	66
65– ..	3,095	2,812	2,234	3,065	2,818	2,017	65
75 and up	4,500	5,175	3,978	4,878	5,102	4,510	100
Females—							
0– ..	4,564	3,921	2,571	5,029	4,143	2,939	64
5– ..	270	191	142	181	189	146	54
15– ..	206	115	92	122	114	101	49
25– ..	320	204	134	228	184	151	47
35– ..	402	283	228	330	297	280	70
45– ..	576	440	313	475	422	386	67
55– ..	1,061	883	666	995	862	710	67
65– ..	2,148	2,109	1,521	2,171	2,048	1,563	73
75 and up	3,806	4,503	3,508	4,210	4,355	4,168	110

Comparison of 1933 with 1930 shows that, despite the epidemic 1933 registered lower pneumonia rates for males between the ages 15 and 75. Since 1911–20 the decline has exceeded 50 per cent. at ages 15–35, and has exceeded 25 per cent. at every age under 75 for each sex.

140–150. **The Puerperal State.**—*Deaths and their Classification.* The number of deaths assigned to diseases of pregnancy, childbirth and the puerperal state was 2,618 (Tables 6, 21 and LXVI), of which 378 or 14·4 per cent. were assigned to abortion, 252 or 9·6 per cent.

to ectopic gestation and other accidents and toxæmias of pregnancy, and the remainder to diseases and accidents of childbirth at full term.

In addition 85 deaths from criminal abortion were assigned to various forms of violence, *e.g.*, suicide, murder, etc., in accordance with the verdicts recorded by the coroners' juries (Tables 25 and LXVI), and 828 deaths of pregnant or parturient women who suffered from various non-puerperal diseases (Table LXVII) were classified to those diseases. The assignment of deaths, attributed to a non-puerperal cause, in association with pregnancy or the puerperal state, to the puerperal group on the one hand or to the non-puerperal cause on the other is carried out in accordance with rules of precedence outlined in the Manual of the International List of Causes of Death.

It should be remembered that the 828 deaths defined by this process as " not classed to pregnancy but returned as associated therewith," or in shorter terminology as " classed to non-puerperal causes," resulted in large part from risks to which the general population of women was exposed and a large proportion of them would have occurred if these women had not been pregnant. Every pregnant woman is exposed to about the same hazards of dying from non-puerperal causes as if she had not been pregnant, and if she does so die the fact of pregnancy or recent parturition is usually mentioned on the death certificate on the grounds that notwithstanding that normal childbearing is a physiological process it is difficult to assert categorically that in the presence of some serious disease it did not, by diminishing the reserves of strength or by some other means, render recovery more difficult. The introduction of the new form of certificate in 1927 undoubtedly resulted in a more complete recording of associated childbearing, since this might in many instances be regarded as " contributing to death but not related to the immediate cause," though neither " primary " nor " secondary " in the terminology of the old form of certificate.

It was suggested in the Review for 1927 (p. 79) that part of the jump in associated deaths noticed in that year was due to this change, and it is perhaps best demonstrated by contrasting the subsequent trend of associated deaths (excluding those assigned to influenza which depend on the presence or absence of an epidemic) with the trend of non-septic puerperal deaths, each in terms of the mean annual deaths in 1924–26 taken as 100.

	1924–6 (mean)	1927	1928	1929	1930	1931	1932	1933
Puerperal non-septic causes	100	93	97	91	90	87	89	87
Non-puerperal causes (except influenza) withassociatedchild-bearing	100	110	110	120	112	122	98	104

No change in the application of the rules of precedence of puerperal over non-puerperal causes was made with the introduction of the new certificate, and the different trends cannot be explained by transfer from the one group to the other. The fall in the number of deaths assigned to puerperal causes other than sepsis is accounted for by the decline in births, but the deaths assigned to other causes having mention of pregnancy or childbirth, instead of falling in sympathy, increased for several years and these deaths during 1931–33 were 8 per cent. in excess of 1924–26 compared with a 12 per cent. deficiency of puerperal non-septic deaths. On this basis it may be estimated that more complete mention of associated childbearing on the new form of medical certificate of death accounts for about one-fifth of the deaths now assigned to causes other than puerperal (Table LXVII) and therefore of the rates from non-puerperal causes (Tables LXXII, LXXIII) and this should be borne in mind when comparing recent rates with those prior to 1927.

It is difficult to estimate what proportion of deaths of pregnant or recently confined women escape inclusion in one or other of these groups. A number of abortion deaths are doubtless attributed to non-puerperal causes without mention of the abortion, but apart from these it seems probable that the great bulk of deaths of married women from any cause between the 4th month of pregnancy and one month after confinement find their way into these groups, and that those who escape are compensated for by the considerable number included with mention of pregnancy of less than 4 months duration or occurring more than one month after confinement. On that assumption the annual number of deaths due to non-puerperal risks to be expected amongst the married women who were pregnant during the year can be approximately estimated by regarding each as exposed to the non-puerperal death rate of married women for the appropriate age during an average period of 6 months. The estimated legitimate live and still births in 1933 to married women at ages 15–25 numbered 124,420, at ages 25–35 331,200 and at 35–45 123,080, and applying to these completed pregnancies the non-puerperal death rates during 1930–32 amongst married women derived from Table XXXIV, the expected deaths number 1,560 in the full year or 780 in half a year (or if they were exposed to the non-puerperal death rates of single women, the expected number would be 989 for the half year. Actually 771 deaths of married women were classed to non-puerperal causes with mention of pregnancy or childbearing.

This supports the view that the number of deaths which are assigned by the methods applied in England and Wales to " non-puerperal causes but associated with pregnancy or childbearing " approximately represents the number which ought properly to be so assigned, and that this group of deaths ought not to be laid at the door of childbearing.

It is true that Table LXVII contains a considerable number of deaths which would more properly be classed as puerperal—

some of these are specified below in the comment on that table—but these tend to be balanced by the inclusion in Table LXVI of deaths following puerperal sepsis of slight degree associated with serious non-puerperal disease, such as lobar pneumonia or pre-existent kidney disease, which, owing to the high precedence always accorded to sepsis over such diseases, are classed to the puerperal cause. In order to ascertain what modification of the distribution of deaths between the puerperal and associated groups would result if the allocation was freed from all such rules of selection of joint causes and based in every instance upon the order of causation stated by the certifying practitioner, the first quarter's deaths for 1934 were classified by both methods with the following result.

	By method laid down in Manual.	By preference as stated on Certificates.
"Puerperal" group	767	752
Non-puerperal or "associated" group	255	242
Indeterminate	—	28
Percentage of determinate deaths assigned to "puerperal" group	75·0	75·7

The indeterminate group consists of certificates completed in such a way that no opinion could be formed as to which was thought to be the most important cause.

It is evident that the total distributions between the puerperal and non-puerperal groups resulting from the two methods are in agreement within a small margin of probable error, and this lends further support to the conclusion arrived at above, by an independent process of reasoning.

The addition of the non-puerperal deaths *in toto* to the deaths assigned to puerperal causes in order to produce a total rate of "mortality from or associated with pregnancy or childbirth," as in Table LXXII, only implies that in this rate are included the deaths from all causes whatsoever (other than criminal abortion) in the course of whose registration it is ascertained that the woman was pregnant or had been confined within a significantly short period. The procedure with regard to the classification of deaths from jointly stated causes at present differs so widely in different countries that the statement of a total rate based upon such a simple definition provides the only possible means of international comparison, but even when so used it is necessary to bear in mind the differing completeness of certification of associated pregnancy in countries employing different forms of certificate.* Whilst these considerations seem to justify the continued statement of the combined rate for certain purposes, this total rate must be regarded as an over-

* Comparability of Maternal Mortality Rates in the United States and certain Foreign Countries. Washington, 1935.

statement of the immediate mortality risk which childbearing involves.

Assessment of puerperal mortality in a form which will be comparable with that of past and future years is also complicated by (1) changes in classification mainly due to the international revisions, (2) the sudden interest in abortion deaths as distinct from other puerperal deaths, (3) the absence of statistics of multiple births and abortions, and (4) the establishment of still-birth registration in 1927. The need for maintaining continuity whilst at the same time making full use of the additional data becoming available at various times in recent years makes a multiplication of rates unavoidable.

Changes of Grouping in 1911, 1921 and 1931 which have affected comparability of the rates may be summarised as follows. In 1911 deaths from puerperal mastitis, previously included with puerperal septicæmia or fever, were transferred to a new group "puerperal diseases of the breast," and have since remained in that group, this transfer from the sepsis group to "other puerperal causes" being responsible for the slight differences in the two series of "puerperal sepsis" rates in Table LXXII. Deaths from puerperal nephritis and albuminuria, previously assigned to diseases of the kidneys, were brought within the puerperal causes as new groups, this addition in conjunction with the transfer of mastitis deaths accounting for the differences in the two series of rates from other puerperal causes in Table LXXII. From that year also "hæmorrhage of pregnancy" was separated from puerperal hæmorrhage, whilst ectopic gestation, "uncontrollable vomiting" and puerperal embolism were separated from other accidents of pregnancy and of childbirth in the annual reports, although the International List did not distinguish them until later revisions.

From 1931 post-abortive sepsis was separated from the general group of puerperal sepsis when abortion was specified, and antepartum hæmorrhage was transferred to the group of non-septic abortion. The latter heading was subdivided for convenience in Tables 6 and 7 into two sub-groups, (1) deaths from "hæmorrhage following abortion" which prior to 1931 had been distinguished only in the detailed table of the Text volume, but elsewhere merged in the old groups of "abortion" and "other accidents of pregnancy," and (2) deaths from "abortion without record of hæmorrhage" which comprised those deaths without mention of hæmorrhage included in the old "abortion" group. In the same year chorea and vomiting of pregnancy were transferred to the new group of "other toxæmias of pregnancy" along with undefined "toxæmia" deaths which had previously been included under the heading puerperal albuminaria and convulsions. Deaths attributed to "puerperal tetanus" were brought within the puerperal causes, the number so described being much too small to appreciably affect the rates. Puerperal thrombosis was also transferred from the

embolism group to " puerperal phlegmasia alba dolens not returned as septic."

In all tables where deaths or rates are shown for a series of years, the transfers necessary to insure comparability with previous years have been effected as far as possible but for certain of the changes in 1931 this could not be done. Thus some of the transfers involved in the formation of the new group of " other toxæmias," No. 147, in 1931, could not be carried out for the preceding years, and in making comparisons with such years in Tables 6, 7, LXXI, LXXIV or LXXV, the two groups 146 and 147 must be considered in conjunction. (This does not apply to Table LXXVI where the necessary transfer of deaths in 1930 has been effected.) For a similar reason No. 141, abortion without sepsis, is comparable before and after 1931, but its sub-divisions taken individually (Tables 6 and 7) are not. This also applies to No. 148, puerperal phlegmasia alba dolens, the subheads shown in Tables 6 and 7 not being comparable before and after 1931 owing to the transfer of puerperal thrombosis from (*b*) to (*c*), though the group as a whole is comparable. With these exceptions no serious error is likely to be involved in reading the tables as they stand, so long as it is remembered that no correction has been or can be made for the gradual changes in fashion or mode of description of the various puerperal causes by certifying medical practitioners. For the years prior to 1911 comparability is made possible by the calculation of a duplicate series of rates (Table LXXII).

Abortion deaths with sepsis were not separated from the comprehensive group of puerperal sepsis in the International List until 1931, but from 1926 deaths from post-abortive sepsis were separately counted where the duration of pregnancy was specified, the number being stated in a footnote to the detailed table of the Text volumes, though still included under the " puerperal sepsis " heading until the end of the decade. It is not possible therefore, to ascertain the total number of abortion deaths in years prior to 1926, but for each year 1926 to 1933 the deaths attributed to or associated with abortion, defined in Tables 6, 7, 25 (supplementary group VI) and in the note to Table LXVII, have been brought together in Table LXVIII. The heading " post-abortive sepsis " includes all deaths attributed to puerperal sepsis where abortion or miscarriage is said to have occurred excepting those in which the duration of pregnancy is stated to have been 7 months or over. Group No. 141 comprises deaths attributed to abortion, miscarriage (not further defined), or to premature birth or confinement stated or found on inquiry to have occurred after less than 7 months' gestation, retention of dead ovum, accidental hæmorrhage of pregnancy or ante-partum hæmorrhage. Criminal abortion comprises only inquest cases, the 85 deaths in 1933 being classed to suicide (52), murder (2), manslaughter (6), offences against the person (1), and open verdicts (24).

Table LXVI.—Deaths of Women classed to Pregnancy and Childbearing, 1933.

Cause of Death	All Ages.	Civil Condition.			Ages.							
		Single.	Married.	Widowed.	10–	15–	20–	25–	30–	35–	40–	45 and upwards
140. Post abortive sepsis	257	30	220	7	—	7	34	51	69	73	21	2
Single	—	30	—	—	—	5	14	6	1	4	—	—
Married	—	—	220	—	—	2	20	43	67	67	19	2
Widowed	—	—	—	7	—	—	—	2	1	2	2	—
Scarlet fever	1	1	—	—	—	1	—	—	—	—	—	—
Bacillus coli infection	1	1	—	—	—	—	—	—	—	1	—	—
Pneumococcal infection	1	—	1	—	—	—	—	—	—	1	—	—
Staphylococcal infection	1	—	1	—	—	—	—	1	—	—	—	—
Streptococcal infection	11	1	10	—	—	—	2	2	3	2	1	1
Gas gangrene	1	—	1	—	—	—	—	—	—	1	—	—
Septic phlegmasia alba dolens, phlebitis and thrombosis	4	—	4	—	—	—	—	—	—	3	—	1
Septic pneumonia	2	—	1	1	—	—	—	—	1	1	—	—
Septicæmia	119	15	103	1	—	2	18	20	33	35	11	—
Sepsis	11	2	9	—	—	1	3	2	1	4	—	—
Septic intoxication, sapræmia	17	—	17	—	—	—	—	4	7	3	3	—
Pelvic peritonitis	6	—	4	2	—	—	1	1	2	2	—	—
Peritonitis	29	5	22	2	—	1	5	9	8	4	2	—
Salpingitis	10	1	9	—	—	—	2	3	1	2	2	—
Metritis	1	—	1	—	—	—	—	—	1	—	—	—
Endometritis	15	1	14	—	—	2	—	5	4	4	—	—
Parametritis	3	—	3	—	—	—	—	1	—	1	1	—
Perimetritis	1	—	1	—	—	—	1	—	—	—	—	—
Erysipelas	1	—	1	—	—	—	—	1	—	—	—	—
Pyæmia	6	1	5	—	—	—	1	—	2	3	—	—
Pelvic cellulitis	5	—	5	—	—	—	—	1	3	1	—	—
Cellulitis	1	1	—	—	—	—	1	—	—	—	—	—
Pelvic abscess	3	1	2	—	—	—	—	1	1	1	—	—
Other specified septic conditions	6	—	5	1	—	—	—	—	2	4	—	—
"Puerperal fever"	1	—	1	—	—	—	—	—	—	—	1	—
141. Abortion not returned as septic	121	9	109	3	—	1	10	19	26	45	18	2
Single	—	9	—	—	—	1	3	2	2	1	—	—
Married	—	—	109	—	—	—	7	17	23	42	18	2
Widowed	—	—	—	3	—	—	—	—	1	2	—	—
(1) Hæmorrhage following abortion.	108	8	98	2	—	1	9	16	23	40	17	2
Single	—	8	—	—	—	1	2	2	2	1	—	—
Married	—	—	98	—	—	—	7	14	20	38	17	2
Widowed	—	—	—	2	—	—	—	—	1	1	—	—
(2) Without record of hæmorrhage.	13	1	11	1	—	—	1	3	3	5	1	—
Single	—	1	—	—	—	—	1	—	—	—	—	—
Married	—	—	11	—	—	—	—	3	3	4	1	—
Widowed	—	—	—	1	—	—	—	—	—	1	—	—
142. Ectopic gestation	90	7	81	*2	—	2	5	22	30	22	*8	1
Single	—	7	—	—	—	2	1	1	1	2	—	—
Married	—	—	81	—	—	—	4	20	29	20	7	1
Widowed	—	—	—	*2	—	—	—	1	—	—	*1	—
143. Other accidents of pregnancy	22	1	20	1	—	—	7	2	6	2	1	4
Single	—	1	—	—	—	—	1	—	—	—	—	—
Married	—	—	20	—	—	—	6	2	5	2	1	4
Widowed	—	—	—	1	—	—	—	—	1	—	—	—
Hydatidiform mole	8	1	7	—	—	—	4	1	—	—	1	2
Carneous mole	1	—	1	—	—	—	—	—	1	—	—	—
Hydramnios	4	—	4	—	—	—	1	—	1	—	—	2
Retroverted gravid uterus	2	—	2	—	—	—	—	—	—	2	—	—
"Pregnancy" (unqualified)	7	—	6	1	—	—	2	1	4	—	—	—
144. Puerperal hæmorrhage	269	6	260	3	—	2	23	65	67	68	41	3
Single	—	6	—	—	—	—	1	3	—	2	—	—
Married	—	—	260	—	—	2	22	62	67	65	39	3
Widowed	—	—	—	3	—	—	—	—	—	1	2	—
(*a*) Placenta prævia	137	3	132	2	—	—	9	29	31	38	27	3
Single	—	3	—	—	—	—	1	1	—	1	—	—
Married	—	—	132	—	—	—	8	28	31	37	25	3
Widowed	—	—	—	2	—	—	—	—	—	—	2	—
(*b*) Other puerperal hæmorrhage.	132	3	128	1	—	2	14	36	36	30	14	—
Single	—	3	—	—	—	—	—	2	—	1	—	—
Married	—	—	128	—	—	2	14	34	36	28	14	—
Widowed	—	—	—	1	—	—	—	—	—	1	—	—
Post partum hæmorrhage	69	3	66	—	—	2	3	21	17	17	9	—
Adherent or retained placenta	49	—	48	1	—	—	10	14	14	7	4	—
Accidental hæmorrhage	14	—	14	—	—	—	1	1	5	6	1	—

* Including 1 divorced woman.

Table LXVI—*continued.*

Cause of Death.	All Ages.	Civil Condition.			Ages.							
		Single.	Married.	Widowed.	10–	15–	20–	25–	30–	35–	40–	45 and upwards
145. Puerperal sepsis not returned as post-abortive.	804	45	756	†3	—	26	137	*241	186	*156	53	5
Single	—	45	—	—	—	4	18	11	3	6	3	—
Married..	—	—	756	—	—	22	118	229	183	149	50	5
Widowed	—	—	—	†3	—	—	1	*1	—	*1	—	—
(*a*) Puerperal septicæmia and pyæmia.	803	45	755	†3	—	26	137	*240	186	*156	53	5
Single	—	45	—	—	—	4	18	11	3	6	3	—
Married..	—	—	755	—	—	22	118	228	183	149	50	5
Widowed	—	—	—	†3	—	—	1	*1	—	*1	—	—
Scarlet fever	1	—	1	—	—	—	—	—	1	—	—	—
Streptococcal infection ..	37	—	37	—	—	1	6	15	8	6	1	—
Pneumococcal infection	1	—	1	—	—	—	—	—	1	—	—	—
Staphylococcal infection	1	—	1	—	—	—	—	1	—	—	—	—
Bacillus col infection ..	2	—	2	—	—	—	—	—	1	1	—	—
Gas gangrene	5	—	5	—	—	—	1	—	1	2	1	—
Septic phlegmasia alba dolens, phlebitis, thrombosis.	38	—	38	—	—	—	4	8	9	9	7	1
Septic pneumonia ..	14	1	13	—	—	—	2	7	3	2	—	—
Septic endocarditis ..	4	—	4	—	—	—	—	2	1	1	—	—
Septicæmia	295	10	284	*1	—	13	49	84	74	*56	18	1
Sepsis	110	8	101	*1	—	4	17	*28	23	31	7	—
Septic intoxication, sapræmia	32	4	28	—	—	—	10	6	7	5	3	1
Pelvic peritonitis ..	12	1	11	—	—	—	3	4	4	1	—	—
Peritonitis	71	3	68	—	—	3	13	19	20	13	3	—
Salpingitis	4	—	4	—	—	—	—	1	3	—	—	—
Metritis	8	2	6	—	—	—	5	1	1	1	—	—
Endometritis	30	2	27	1	—	—	4	9	8	7	2	—
Parametritis	11	1	10	—	—	—	—	7	2	1	1	—
Erysipelas	11	2	9	—	—	—	1	3	4	2	—	1
Pyæmia	21	—	21	—	—	—	1	10	2	7	1	—
Pelvic cellulitis	26	4	22	—	—	—	7	13	4	1	—	1
Pelvic abscess	4	—	4	—	—	1	1	—	1	—	1	—
Other specified septic conditions	9	1	8	—	—	1	1	4	—	3	—	—
" Puerperal fever " ..	56	6	50	—	—	3	12	18	8	7	8	—
(*b*) Puerperal tetanus.. ..	1	—	1	—	—	—	—	1	—	—	—	—
Single	—	—	—	—	—	—	—	—	—	—	—	—
Married..	—	—	1	—	—	—	—	1	—	—	—	—
Widowed	—	—	—	—	—	—	—	—	—	—	—	—
146. Puerperal albuminuria and convulsions	372	25	345	2	1	15	76	106	69	61	40	4
Single	—	25	—	—	1	4	11	5	3	1	—	—
Married..	—	—	345	—	—	11	65	101	66	58	40	4
Widowed	—	—	—	2	—	—	—	—	—	2	—	—
147. Other toxæmias of pregnancy ..	140	16	124	—	—	2	41	34	27	21	14	1
Single	—	16	—	—	—	—	9	4	3	—	—	—
Married..	—	—	124	—	—	2	32	30	24	21	14	1
Widowed	—	—	—	—	—	—	—	—	—	—	—	—
Chorea	9	2	7	—	—	1	5	2	1	—	—	—
Toxæmia of pregnancy ..	73	7	66	—	—	1	12	15	18	15	11	1
Puerperal Toxæmia	2	—	2	—	—	—	1	—	1	—	—	—
Uncontrollable vomiting ..	56	7	49	—	—	—	23	17	7	6	3	—
148. Puerperal phlegmasia alba dolens, embolism and sudden death ..	175	6	168	1	—	3	20	44	35	38	33	2
Single	—	6	—	—	—	2	1	1	1	1	—	—
Married..	—	—	168	—	—	1	19	43	34	37	33	1
Widowed	—	—	—	1	—	—	—	—	—	—	—	1
(*a*) Puerperal phlegmasia alba dolens not returned as septic	55	2	52	1	—	—	6	14	11	10	12	2
Single	—	2	—	—	—	—	1	—	1	—	—	—
Married..	—	—	52	—	—	—	5	14	10	10	12	1
Widowed	—	—	—	1	—	—	—	—	—	—	—	1
(*b*) Puerperal embolism and sudden death	120	4	116	—	—	3	14	30	24	28	21	—
Single	—	4	—	—	—	2	—	1	—	1	—	—
Married..	—	—	116	—	—	1	14	29	24	27	21	—
Widowed	—	—	—	—	—	—	—	—	—	—	—	—

* Including 1 divorced woman.
† Including 2 divorced women.

Table LXVI—*continued.*

Cause of Death.	All Ages.	Civil Condition.			Ages.							
		Single.	Married.	Widowed.	10–	15–	20–	25–	30–	35–	40–	45 and upwards
149. Other accidents of childbirth ..	311	16	291	4	—	9	49	86	71	74	20	2
Single	—	16	—	—	—	2	7	4	1	2	—	—
Married..	—	—	291	—	—	7	42	82	69	70	19	2
Widowed	—	—	—	4	—	—	—	—	1	2	1	—
Contracted pelvis	80	2	78	—	—	2	13	25	20	17	3	—
Craniotomy	1	—	1	—	—	—	—	—	1	—	—	—
Instrumental delivery ..	20	2	18	—	—	1	3	6	5	5	—	—
Malpresentation ..	30	—	30	—	—	—	9	4	7	6	4	—
Version	2	—	1	1	—	—	—	—	—	1	1	—
Abnormal fœtus ..	8	—	8	—	—	—	1	3	2	2	—	—
Difficult and prolonged labour	74	7	64	3	—	4	11	27	16	13	3	—
Cæsarean section (reason unstated)†	16	1	15	—	—	1	—	3	4	6	2	—
Rupture of uterus	26	1	25	—	—	—	4	2	6	8	5	1
Laceration of uterus	1	—	1	—	—	—	—	—	1	—	—	—
Laceration of cervix	1	—	1	—	—	—	—	1	—	—	—	—
Laceration of vagina	1	—	1	—	—	—	1	—	—	—	—	—
Repair of perineum	1	—	1	—	—	—	1	—	—	—	—	—
Inversion of uterus	9	1	8	—	—	—	2	4	1	1	—	1
Subinvolution of uterus ..	1	—	1	—	—	—	—	—	—	1	—	—
Uterine inertia	13	2	11	—	—	—	—	8	2	3	—	—
Rigidity of cervix	2	—	2	—	—	—	—	—	—	2	—	—
Adherent or retained placenta	13	—	13	—	—	1	2	2	2	4	2	—
Precipitate labour	3	—	3	—	—	—	—	—	3	—	—	—
Stillborn	1	—	1	—	—	—	—	—	—	1	—	—
Twinbirth	8	—	8	—	—	—	2	1	1	4	—	—
150. Other or unspecified conditions of the puerperal state	57	1	56	—	—	2	8	17	10	13	5	2
Single	—	1	—	—	—	—	1	—	—	—	—	—
Married..	—	—	56	—	—	2	7	17	10	13	5	2
Widowed	—	—	—	—	—	—	—	—	—	—	—	—
(1) Puerperal insanity ..	11	1	10	—	—	—	3	5	2	1	—	—
Single	—	1	—	—	—	—	1	—	—	—	—	—
Married..	—	—	10	—	—	—	2	5	2	1	—	—
Widowed	—	—	—	—	—	—	—	—	—	—	—	—
(2) Puerperal diseases of the breast	17	—	17	—	—	1	1	8	3	1	2	1
Single	—	—	—	—	—	—	—	—	—	—	—	—
Married..	—	—	17	—	—	1	1	8	3	1	2	1
Widowed	—	—	—	—	—	—	—	—	—	—	—	—
(3) Childbirth (unqualified) ..	29	—	29	—	—	1	4	4	5	11	3	1
Single	—	—	—	—	—	—	—	—	—	—	—	—
Married..	—	—	29	—	—	1	4	4	5	11	3	1
Widowed ..	—	—	—	—	—	—	—	—	—	—	—	—
(with secondary causes as follows) :—												
Anæmia	4	—	4	—	—	—	—	1	1	1	1	—
Mitral stenosis.. ..	1	—	1	—	—	—	—	—	—	1	—	—
Myocarditis	3	—	3	—	—	—	—	1	—	2	—	—
Pneumonia	5	—	5	—	—	—	1	2	1	—	1	—
Broncho pneumonia ..	4	—	4	—	—	1	—	—	—	3	—	—
Pleurisy	1	—	1	—	—	—	—	—	1	—	—	—
Intestinal stasis ..	1	—	1	—	—	—	1	—	—	—	—	—
Without stated secondary cause ..	10	—	10	—	—	—	2	—	2	4	1	1
Total	2,618	162	2,430	‡26	1	69	410	*687	596	*573	*254	28
Single	—	162	—	—	1	20	67	37	15	19	3	—
Married..	—	—	2,430	—	—	49	342	646	577	544	245	27
Widowed	—	—	—	‡26	—	—	1	*4	4	*10	*6	1
Criminal abortion (*see* Table 25)	85	24	52	*9	—	1	19	20	25	18	1	1
Single	—	24	—	—	—	1	11	9	3	—	—	—
Married..	—	—	52	—	—	—	8	10	19	13	1	1
Widowed	—	—	—	*9	—	—	—	1	*3	5	—	—

* Including 1 divorced woman.

† In addition Cæsarean section was stated to have been performed in the case of 109 deaths included in other headings in this table—concealed accidental hæmorrhage of pregnancy 1, hydramnios 1, placenta prævia 10, accidental hæmorrhage 3, puerperal albuminuria and convulsions 9, toxæmia of pregnancy 6, contracted pelvis 51, malpresentation 4, hydrocephalic fœtus 1, difficult labour 17, ruptured uterus 3, rigidity of cervix 2, twinbirth 1.

‡ Including 3 divorced women.

Table LXVII—Deaths of Women not classed to Pregnancy and Childbearing, but returned as associated therewith, 1933.

	Cause of Death.	All Ages.	Ages. 15–	20–	25–	30–	35–	40–	45 and upwards.
1	Enteric fever	1	—	1	—	—	—	—	—
7	Measles	1	1	—	—	—	—	—	—
8	Scarlet Fever	3	—	—	2	1	—	—	—
11	Influenza	129	1	16	31	39	22	19	1
23	Tuberculosis of respiratory system	73	3	18	28	12	8	3	1
24–32	Other forms of tuberculosis	12	—	4	2	3	1	2	—
34 (*b*) (*c*)	Syphilis acquired or unspecified	8	—	1	2	2	2	1	—
35 (2)	Gonococcal cervicitis	1	—	—	—	—	1	—	—
36 (*a*)	Septicæmia	2	—	—	1	—	—	1	—
45–53	Cancer	15	—	2	—	3	3	5	2
54 (*a*)	Non-malignant tumours of female genital organs	19	—	1	2	5	8	2	1
54 (*b*) 55 (*b*)	Tumours of other sites	2	—	1	1	—	—	—	—
56	Rheumatic fever	8	—	1	—	4	2	1	—
59	Diabetes	17	—	2	5	6	3	—	1
65 (2)	Pituitary deficiency	1	—	1	—	—	—	—	—
66 (*a*)	Goitre	1	—	—	—	—	—	1	—
66 (*b*)	Exophthalmic goitre	8	—	—	4	1	1	2	—
66 (*c*)	Thyroid insufficiency	1	—	—	—	—	—	1	—
66 (*e*)	Thyroiditis	1	—	—	1	—	—	—	—
68	Adrenal insufficiency	1	—	—	—	1	—	—	—
71 (*a*)	Pernicious anæmia	17	—	—	4	4	7	1	1
71 (*b*)	Splenic anæmia	1	—	—	—	—	1	—	—
72 (*a*)	Leukæmia	2	—	1	—	1	—	—	—
82 (*a*)	Cerebral hæmorrhage	4	—	1	1	2	—	—	—
84	Other forms of insanity	3	—	1	1	1	—	—	—
85	Epilepsy	9	—	1	4	2	—	2	—
87 (*b*)	Neuritis, neuralgia	2	—	—	1	—	—	1	—
87 (*d*)	Disseminated sclerosis	3	—	—	—	—	2	1	—
87 (*e*)	Spastic diplegia	1	—	—	—	—	1	—	—
90	Pericarditis	1	—	—	—	1	—	—	—
91 (1)	Malignant endocarditis	7	—	4	1	2	—	—	—
92 (2)	Mitral valve disease	83	2	13	26	22	17	3	—
92 (3, 4, 5)	Other or unspecified valvular disease	27	—	5	7	5	6	4	—
93 (*a*)	Acute myocarditis	1	—	—	1	—	—	—	—
93 (*b*) (1)	Fatty heart	8	—	2	1	3	—	1	1
93 (*b*) (2)	Cardiovascular degeneration	1	—	—	—	—	1	—	—
93 (*b*) (3), 93 (*c*)	Other or unspecified myocardial disease	28	—	5	5	5	10	3	—
94	Diseases of the coronary arteries, angina pectoris	3	—	—	1	1	—	1	—
95	Other diseases of the heart	9	—	—	2	3	3	1	—
96	Aneurysm	1	—	—	—	—	1	—	—
97 (3)	Arterio sclerosis	1	—	—	—	—	—	—	1
99	Other diseases of the arteries	2	—	—	—	2	—	—	—
100 (1)	Varix	3	—	—	—	—	3	—	—
100 (2)	Other diseases of the veins	3	—	—	1	—	2	—	—
106	Bronchitis	7	—	—	2	—	3	2	—
107	Broncho-pneumonia	25	—	3	6	7	7	1	1

Table LXVII—*continued.*

Cause of Death.	All Ages.	Ages.						
		15–	20–	25–	30–	35–	40–	45 and upwards.
108 Lobar pneumonia	69	—	10	14	21	15	9	—
109 Pneumonia (not otherwise defined)	14	—	—	3	4	5	2	—
110 (1) Empyema	1	—	1	—	—	—	—	—
110 (2) Other pleurisy	2	—	—	—	1	1	—	—
111 Congestion and hæmorrhagic infarct of lung, etc. ..	2	—	1	—	1	—	—	—
112 Asthma	9	—	1	—	3	3	2	—
114 (*b*) (2) Pulmonary abscess (nature unstated)	1	—	—	—	—	1	—	—
115 (1) Dental abscess	1	—	—	—	—	1	—	—
115 (3) Diseases of the tonsils ..	4	—	1	—	2	1	—	—
115 (4) Other diseases of the buccal cavity, pharynx, etc. ..	2	—	—	—	—	2	—	—
117 (*a*) Ulcer of the stomach	2	—	—	—	1	—	1	—
117 (*b*) Ulcer of the duodenum ..	1	—	—	1	—	—	—	—
118 Other diseases of the stomach	2	—	—	—	2	—	—	—
119 & 120 (*a*) (1) Colitis	2	—	—	1	—	1	—	—
119 & 120 (*a*) (2) Gastro-enteritis ..	1	—	—	—	—	—	1	—
121 Appendicitis	9	1	1	4	2	1	—	—
122 (*a*) (1) Strangulated hernia ..	2	—	—	1	—	1	—	—
122 (*b*) Intestinal obstruction ..	40	—	3	7	12	9	8	1
123 (3) Recto-vaginal fistula	1	—	—	—	—	1	—	—
125 (1) Acute yellow atrophy ..	34	1	9	10	4	8	2	—
126 (1) Biliary calculi with cholecystitis	1	—	—	—	1	—	—	—
128 Diseases of the pancreas ..	3	—	—	—	—	2	1	—
131 Chronic nephritis	55	—	3	8	17	16	8	3
133 (*a*) Pyelitis	3	—	—	2	1	—	—	—
133 (*b*) Other diseases of the kidney and annexa	2	—	—	1	—	1	—	—
134 (*a*) Ureteric calculus	1	—	—	1	—	—	—	—
139 (*a*) (1) Oöphoritis	1	—	—	1	—	—	—	—
139 (*d*) Abscess of vulva	1	—	—	—	—	—	1	—
152 (1) Cellulitis right leg	1	—	—	—	—	1	—	—
153 Pemphigus	1	—	—	—	1	—	—	—
154 Acute osteomyelitis of sacrum	1	1	—	—	—	—	—	—
156 (*a*) Pneumococcal arthritis ..	1	—	—	—	—	—	1	—
157 (*e*) Congenital coccygeal cyst ..	1	—	1	—	—	—	—	—
163–198 Violence	1	—	—	1	—	—	—	—
Total	828*	10	115	198	211	185	95	14
Single	50	3	20	15	4	4	4	—
Married	771	7	95	182	205	177	91	14
Widowed	7	—	—	1	2	4	—	—
Associated with abortion (included above)	97	1	8	17	36	20	15	—
Single ..	6	—	1	3	1	—	1	—
Married ..	90	1	7	14	34	20	14	—
Widowed ..	1	—	—	—	1	—	—	—

* Of these 828 deaths, 230 were stated to be associated with pregnancy, 97 with abortion, 42 with premature delivery, 5 with delivery at full term, and 454 with childbirth. Cæsarean section was stated to have been performed in the case of 45 of these deaths, of which 21 were attributed to ileus following Cæsarean section and assigned to No. 122 (*b*) above (*see* p. 109 for corresponding numbers in 1921 to 1932).

Table LXVIII.—Deaths attributed to, or associated with, Abortion, 1926-33.

Old List No.	New List No.		1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
Part of 146	140	Post-abortive sepsis ..	222	215	224	238	300	229	262	257
	141	Abortion not returned as septic :—								
Part of 143c		(1) Hæmorrhage following abortion.	72	72	47	51	59	97	105	108
143a		(2) Without record of hæmorrhage.	86	82	77	67	65	21	12	13
199, 202	VI (Table 25).	Criminal abortion (inquest cases).	51	47	57	67	67	79	69	85
		Total attributed to abortion.	431	416	405	423	491	426	448	463
		Associated with abortion but not classed to it.	?	?	83	182*	77	77	90	97
		Total attributed to, and associated with, abortion.	?	?	488	605	568	503	538	560

* The excessive number of deaths associated with abortion but not classed to it in 1929 was partly due to the influenza epidemic of that year and partly to the allocation to abortion rather than to childbirth for that year only of 63 deaths said to be associated with premature delivery without definition as to length of gestation

It should be noted that abortions resulting from other complications of pregnancy are still classed to Nos. 143, 146, 147 and do not appear under any of the "abortion" headings unless there is some other associated condition causing the death to appear in Table LXVII. Such abortions, which are secondary to a toxæmia or some other morbid condition of pregnancy, even if they could all be ascertained by special inquiry, are in a class by themselves and there would seem to be little justification for adding them to Table LXVIII.

It has been frequently alleged that the increase in mortality from puerperal sepsis may be due to increase in the proportion of deaths from septic abortion. The percentage ratios of deaths classified to puerperal sepsis and stated to have occurred after abortion to the total deaths from puerperal sepsis for the years 1926–33 are as follows :—

1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
20·0	20·9	18·9	20·5	24·1	21·8	26·4	24·2

Many medical certificates, however, contain no mention of whether the sepsis followed abortion or delivery at term, and during 1932 inquiry was made regarding a sample of 100 deaths attributed to " puerperal sepsis " and having no statement as to the duration of pregnancy. The result was that 4 were assigned to post-abortive sepsis (No. 140) and 96 to puerperal sepsis not returned as abortion (No. 145), 90 of the latter being definitely stated as " full-term," 4 as premature but over 28 weeks' gestation, and 2 presumably full term. The residual number of deaths from puerperal sepsis with no statement as to duration of pregnancy was 412, and assuming the sample of 100 to have been representative, 4 per cent. of these, or 16 deaths, probably also belonged to the septic abortion group.

When this correction was made, the post-abortive sepsis deaths were raised to 278 and the total attributed to abortion to 464, or including those associated with abortion, 554. If it is further desired to make the 1929, 1930, 1931 and 1933 totals comparable with the 1932 figures corrected in this way, the sepsis deaths having no statement numbered 637, 670, 537 and 515 in those years and 4 per cent. of these numbers should be transferred to the abortion totals in Table LXVIII. The 63 deaths mentioned in the note below that table should also be omitted from the "associated with abortion" total in 1929. The effect of these corrections upon the mortality rates from abortion in each year from 1929 is explained in the note below Table LXXIII.

Table LXVI gives particulars of all deaths assigned in 1933 to the puerperal state with *detail of cause* within each international heading 140 to 150, and of criminal abortion deaths, according to the civil condition and age of the deceased. Subdivision of each main heading into 3 lines now makes it possible to distinguish the ages at death from the specified cause for single, married or widowed women separately. The relative distribution of these deaths according to cause is seen from Table LXIX to have undergone considerable changes since 1921. Puerperal sepsis comprised 35·4 per cent. of the total of puerperal deaths plus criminal abortion

Table LXIX.—Deaths from certain puerperal causes per cent. of all puerperal causes plus criminal abortion, 1921–25, 1926–30 and 1933.

	1933.					1921–25.	1926–30.	1933.
	Single.		Married.			Women of all ages.		
	15–25.	25–45.	15–25.	25–35.	35–45.			
Puerperal sepsis (140, 145) ..	41·4	39·5	40·6	41·7	35·5	35·4	39·8	39·3
Abortion (all forms)	35·4	32·6	9·3	14·3	19·9	?	15·0	17·1
Puerperal hæmorrhage (not abortion).	1·0	5·8	6·0	10·3	13·0	13·5	11·5	10·0
Puerperal albuminuria and toxæmias.	24·2	18·6	27·6	17·7	16·6	19·4	20·0	18·9
Puerperal phlegmasia alba dolens.	3·0	3·5	5·0	6·2	8·7	9·1	6·7	6·5
Other accidents of childbirth	9·1	8·1	12·3	12·1	11·1	7·8	9·4	11·5

during 1921–25, but by 1933 the percentage had increased to 39·3. Age and civil condition have little influence upon this ratio. Puerperal phlegmasia alba dolens has declined relatively to the total, though not in recent years, and the proportion of puerperal hæmorrhage deaths has also declined. Increasing precision of certification has probably caused some transfer from these to other groups. The albuminuria and toxæmia deaths continue to form about one-fifth of the total, but the proportion is considerably higher for young women under 25. Other accidents of childbirth formed 7·8 per cent. in 1921–25, but this had risen to 11·5 per cent. by 1933.

Abortion deaths (including those classed to the headings of criminal abortion) form 17·1 per cent. of the total in 1933 compared with 15·0 in the quinquennium 1926–30. Amongst single women, whether under or over 25 years of age, abortion deaths form about one-third of the total, but amongst the married the percentage increases with advancing age from 9·3 at 15–25 to 19·9 at 35–45.

Table LXVII gives, in detail of the International List, the *non-puerperal causes* to which deaths stated to have been complicated by the existence of the puerperal state were assigned in 1933. The largest numbers in the table are—influenza 129, mitral valve disease 83, tuberculosis of the respiratory system 73, lobar pneumonia 69, chronic nephritis 55, intestinal obstruction 40, and acute yellow atrophy of the liver 34. The number classed to influenza was greater than in the preceding 3 years (23, 94, 55) but less than in the epidemic year of 1929 (155). Phthisis, lobar pneumonia and mitral disease are given precedence over puerperal conditions as a rule on the ground of their infective nature or prior origin in point of time. When lobar pneumonia originates after delivery, some puerperal cause is not infrequently stated on the certificate of death as the "morbid condition giving rise to" the pneumonia (in 10 deaths out of the 69), but the assignment is made in accordance with the rules of precedence in the Manual, that is to the puerperal cause in cases of sepsis or phlegmasia alba dolens but to lobar pneumonia otherwise.

Similar considerations apply to *intestinal obstruction*, and in this instance, owing to increasing attribution of deaths to paralytic ileus following operative procedures involving abdominal section, this group has become somewhat overweighted. Ileus following operative procedures has always been accorded the same preference, in the classification of joint causes, as other forms of ileus, and in 1933 21 deaths attributed to ileus, mostly paralytic, following Cæsarean section are included under the heading 122 (*b*) Intestinal obstruction in Table LXVII (5 in 1921). Whilst it is desirable that where death from paralytic ileus follows such operations as Cæsarean section the classification should be made to the cause requiring the operation, such a change of classification would interfere with the comparability of the statistics with those of preceding years, and it is considered preferable to continue the assignment of such deaths to this group during the present decade but to indicate the number so included in a note below Table LXVII.

Although no national statistics are available of the frequency with which *Cæsarean section* is resorted to, this frequency has certainly increased during the past decade, and this is reflected in the increasing number of deaths with mention of this operation, partly assigned to puerperal and partly to non-puerperal causes (Table LXX). In 1921–23 and succeeding triennia to 1930–32,

Table LXX—Deaths with Mention of Cæsarean Section, 1921–1933.

	Assigned to Puerperal Causes.						Assigned to non-puerperal causes.			Total with mention of Cæsarean Section.
	Placenta prævia.	Contracted pelvis.	Albuminuria, etc.	Other specified.	Reason not stated.	Total.	Intestinal Obstruction.	Other Causes.	Total.	
1921 ..	4	19	3	13	50	89	5	18	23	112
1922 ..	5	9	9	25	20	68	7	13	20	88
1923 ..	1	8	8	35	33	85	5	18	23	108
1924 ..	7	39	6	32	4	88	11	13	24	112
1925 ..	9	31	8	32	10	90	11	18	29	119
1926 ..	6	40	16	30	5	97	10	12	22	119
1927 ..	5	24	10	56	2	97	8	23	31	128
1928 ..	9	40	16	46	2	113	11	24	35	148
1929 ..	15	55	9	17	8	104	11	35	46	150
1930 ..	11	43	8	25	5	92	23	27	50	142
1931 ..	14	54	16	41	10	135	16	32	48	183
1932 ..	13	46	10	38	9	116	22	30	52	168
1933 ..	10	51	9	39	16	125	21	24	45	170

these deaths averaged 103, 117, 142 and 164 per annum, and in 1933 numbered 170. Prior to 1924 the reason for resorting to Cæsarean section was often unstated, but from that year onwards has been ascertained for all except a small residue of deaths. In 1931–33, 29 per cent. of the total deaths were assigned to contracted pelvis, 7 per cent. each to placenta prævia and eclampsia, 23 per cent. to other specified puerperal causes, 7 per cent. to some unstated puerperal cause, 11 per cent. to intestinal obstruction and 16 per cent. to other non-puerperal causes.

Deaths attributed to *chronic nephritis* in conjunction with puerperal sepsis or phlegmasia alba dolens are assigned as a rule to the puerperal cause, but if associated with other puerperal conditions the assignment is usually to chronic nephritis on the ground of its presumed priority in point of time. An examination of the certificates of the 55 deaths included in Table LXVII reveals the fact that in the case of 10 a preference for the puerperal condition as the underlying cause seemed to be expressed by the certifying practitioner and in the case of 43 a preference for chronic nephritis. A test carried out on the first quarter's deaths of 1934 shows that this over-assignment to chronic nephritis of the non-septic deaths is almost offset by an over-assignment to the puerperal cause of deaths in which a slight degree of sepsis played a part.

Acute yellow atrophy of the liver occupies a somewhat anomalous position in Table LXVII, its exclusion from the category of " other toxæmias of pregnancy " being in accordance with a decision of the International Conference of 1929. It may be noted as an indication of the trend of opinion as to the significance of this disease that in the case of 22 deaths out of 34 assigned to this cause with associated childbearing in 1933, preference for the puerperal condition as underlying cause was expressed by the certifier.

Analysis of the 828 deaths in Table LXVII according to the views of the certifying practitioner gave the following result.

Preference given to puerperal cause.		
By order of statement on certificate		108
Otherwise (chiefly coroners' cases)		11
Preference given to non-puerperal cause.		
By order of statement on certificate		541
Otherwise (chiefly coroners' cases)		44
Preference not clearly expressed.		
Inverted or impossible order of statement, but preference apparently intended for	Puerperal cause ..	7
	Non-puerperal cause ..	49
	Doubtful	18
Other doubtful forms of statement		50

In all about 126 deaths would, if the alternative system of assignment were adopted, be transferred to the puerperal group, but, as ascertained above from the complete sample of both groups in the March quarter of 1934, this change would be balanced by a transfer in the opposite sense of approximately the same number of deaths now classed to the puerperal group (*e.g.*, deaths attributed jointly to pneumonia or kidney disease with puerperal sepsis of slight degree.)

Table LXXI analyses the deaths assigned to each principal puerperal cause and to criminal abortion, according to *civil condition*

Table LXXI—Maternal Deaths from Various Causes by Civil Condition and age, 1924 to 1933.

International List No.			1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
			Number of Deaths									
140–150	XI Diseases of Pregnancy, Childbirth and the Puerperal State: All Ages	S	2,847	2,900	2,863	2,691	153	165	175	156	155	162
		M					2,741	2,601	2,650	2,423	2,409	2,430
		W					27	25	30	22	23	26
	15–	S	494	547	514	447	79	93	94	81	77	88
		M					432	412	378	419	357	391
		W					1	—	—	1	1	1
	25–	S	1,325	1,362	1,394	1,340	59	57	50	61	51	52
		M					1,340	1,328	1,378	1,257	1,251	1,223
		W					10	8	12	9	5	8
	35–	S	982	943	921	862	15	15	30	14	27	22
		M					935	837	863	718	771	789
		W					14	17	16	12	15	16
	45 and up	S	46	48	34	42	—	—	1	—	1	—
		M					34	24	31	29	30	27
		W					2	—	2	—	1	1
140 & 145	Puerperal sepsis All Ages	S	1,018	1,110	1,112	1,027	72	77	79	76	76	75
		M					1,100	1,075	1,153	960	908	976
		W					13	9	12	14	7	10
	15–	All	200	236	229	195	234	242	234	232	188	204
	25–	„	499	542	567	520	594	607	656	541	534	547
	35–	„	313	312	307	298	350	305	342	275	256	303
	45 and up	„	6	20	9	14	7	7	12	2	13	7

Table LXXI.—*continued.*

International List No.			1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
			Number of Deaths.									
140	Post abortive sepsis	S	?	?	222	215	20	27	26	34	38	30
	All Ages	M					198	205	271	189	219	220
		W					6	6	3	6	5	7
	15–	All	?	?	?	?	?	?	?	40	45	41
	25–	,,	?	?	?	?	?	?	?	113	127	120
	35–	,,	?	?	?	?	?	?	?	75	88	94
	45 and up	,,	?	?	?	?	?	?	?	1	2	2
141	Abortion not returned as septic	S	179	156	158	154	4	3	6	5	9	9
	All Ages	M					120	114	115	113	106	109
		W					—	1	3	—	2	3
	15–	All	14	11	15	13	7	9	8	10	7	11
	25–	,,	76	60	70	64	59	48	45	55	51	45
	35–	,,	85	80	69	71	53	59	70	48	56	63
	45 and up	,,	4	5	4	6	5	2	1	5	3	2
142	Ectopic gestation	S	73	87	94	98	3	5	4	4	4	7
	All Ages	M					81	79	68	74	77	81
		W					2	2	1	1	2	2
	15–	All	6	9	8	10	8	6	2	6	3	7
	25–	,,	39	54	44	54	42	48	41	40	46	52
	35–	,,	27	24	40	33	32	31	29	32	33	30
	45 and up	,,	1	—	2	1	4	1	1	1	1	1
143	Other accidents of pregnancy.	S	20	19	19	25	2	2	2	—	2	1
	All Ages	M					12	14	14	23	17	20
		W					—	—	—	—	—	1
	15–	All	4	—	4	3	3	2	1	5	3	7
	25–	,,	10	9	8	10	8	8	9	6	10	8
	35–	,,	5	10	6	8	2	5	5	9	6	3
	45 and up	,,	1	—	1	4	1	1	1	3	—	4
144	Puerperal hæmorrhage	S	390	373	339	327	12	15	16	10	7	6
	All Ages	M					314	294	329	276	280	260
		W					5	4	3	3	4	3
	15–	All	33	43	33	35	41	27	41	35	28	25
	25–	,,	174	166	161	146	152	139	164	140	133	132
	35–	,,	173	157	139	142	132	143	136	111	123	109
	45 and up	,,	10	7	6	4	6	4	7	3	7	3
145	Puerperal sepsis not returned as post-abortive.	S	?	?	890	812	52	50	53	42	38	45
	All Ages	M					902	870	882	771	689	756
		W					7	3	9	8	2	3
	15–	All	?	?	?	?	?	?	?	192	143	163
	25–	,,	?	?	?	?	?	?	?	428	407	427
	35–	,,	?	?	?	?	?	?	?	200	168	209
	45 and up	,,	?	?	?	?	?	?	?	1	11	5
146	Puerperal albuminuria and convulsions.	S	524	499	524	537	38	35	34	31	24	25
	All Ages	M					518	486	427	342	346	345
		W					1	3	6	2	3	2
	15–	All	146	132	124	116	128	128	96	100	98	92
	25–	,,	215	233	239	267	250	253	228	178	165	175
	35–	,,	154	127	153	148	173	138	138	93	106	101
	45 and up	,,	9	7	8	6	6	5	5	4	4	4
147	Other toxæmias of pregnancy.	S	54	56	57	45	2	4	8	7	13	16
	All Ages	M					43	60	57	124	137	124
		W					—	2	1	—	1	—
	15–	All	15	18	23	10	13	18	21	30	30	43
	25–	,,	24	26	23	28	20	31	30	73	79	61
	35–	,,	15	11	11	7	12	17	15	26	40	35
	45 and up	,,	—	1	—	—	—	—	—	2	2	1

Table LXXI—*continued.*

International List No.			1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
			Number of Deaths.									
148	Puerperal phlegmasia albadolens, embolism and sudden death.											
	All Ages	S	244	240	202	175	6	8	9	9	5	6
		M					212	169	180	179	195	168
		W					1	3	1	—	—	1
	15–	All	26	41	24	19	25	17	27	27	25	23
	25–	,,	128	116	110	92	108	97	97	107	90	79
	35–	,,	84	81	67	63	82	65	64	53	84	71
	45 and up	,,	6	2	1	1	4	1	2	1	1	2
149	Other accidents of childbirth.											
	All Ages	S	235	247	272	251	14	10	13	11	12	16
		M					290	263	231	289	271	291
		W					3	1	2		3	4
	15–	All	40	42	38	32	42	45	34	44	45	58
	25–	,,	106	109	132	137	149	137	123	168	155	157
	35–	,,	81	93	99	77	114	91	84	81	85	94
	45 and up	,,	8	3	5	5	2	1	5	7	1	2
150	Other or unspecified conditions of the puerperal state.											
	All Ages	S	110	113	86	52	—	6	4	3	3	1
		M					51	47	76	43	72	56
		W					2	—	1	2	1	—
	15–	All	10	15	16	14	11	11	8	12	8	10
	25–	,,	54	47	40	22	27	25	47	19	44	27
	35–	,,	45	48	30	15	14	15	26	16	24	18
	45 and up	,,	1	3	—	1	1	2	—	1	—	2
—	Criminal Abortion											
	All Ages	S	38	67	51	47	19	22	12	20	20	24
		M					36	40	45	56	45	52
		W					2	5	10	3	4	9
	15–	All	12	17	12	14	12	19	12	14	16	20
	25–	,,	13	33	28	22	33	36	36	45	43	45
	35–	,,	13	17	11	11	12	12	18	20	9	19
	45 and up	,,	—	—	—	—	—	—	1	—	1	1
—	Deaths assigned to other causes but associated with childbearing.											
	All Ages	S	849	759	709	861	49	44	46	39	38	50
		M					732	904	719	868	670	771
		W					9	12	9	4	5	7
	15–	All	120	108	120	113	128	148	98	126	110	125
	25–	,,	399	362	318	397	367	476	372	425	331	409
	35–	,,	319	279	255	334	284	321	298	346	266	280
	45 and up	,,	11	10	16	17	11	15	6	14	6	14
—	Deaths assigned to other causes but associated with abortion.											
	All Ages	S	?	?	?	?	83	119	77	77	90	6
		M										90
		W										1
	15–	All	?	?	?	?	8	21	11	9	13	9
	25–	,,	?	?	?	?	44	64	37	39	39	53
	35–	,,	?	?	?	?	30	33	29	29	38	35
	45 and up	,,	?	?	?	?	1	1	—	—	—	—
—	Deaths assigned to other causes but associated with pregnancy and childbirth (not abortion).											
	All Ages	S	?	?	?	?	707	841	697	834	623	44
		M										681
		W										6
	15–	All	?	?	?	?	120	127	87	117	97	116
	25–	,,	?	?	?	?	323	412	335	386	292	356
	35–	,,	?	?	?	?	254	288	269	317	228	245
	45 and up	,,	?	?	?	?	10	14	6	14	6	14

of the deceased in each year since 1928, and according to *age* (for all women regardless of civil condition) in each year since 1924. Deaths classed to non-puerperal causes with associated pregnancy or child-bearing, separating those associated with abortion since 1928, are also given in the same table, these being collated from Table LXVII and its predecessors since 1924. The age-specific rates of mortality calculated from this analysis are given in Tables LXXV and LXXVI.

Rates of Mortality.—Maternal mortality rates should properly be based upon the number of pregnancies, but this number cannot be ascertained owing to the absence of statistics of abortions and of multiple births. It is, therefore, necessary to choose between some approximation to this number, such as the registered annual births, and the total living population of women of the specified class whether pregnant or not. In the Reviews for years 1921–30, crude death rates per million women of all ages were shown in

Table LXXII.—Mortality of Women in or associated with Childbirth per Thousand Children born alive, 1891–1933.

Year.	Classification in use from 1911 onwards.				Classification in use before 1911.				‡ Total Mortality from or associated with pregnancy or childbirth.
	Puerperal Sepsis.	Other Puerperal causes.	Total Puerperal Mortality.	* Non-puerperal causes.	Puerperal Sepsis.	Other Puerperal causes.	Total Puerperal Mortality.	† Non-puerperal causes.	
1891–95	—	—	—	—	2·60	2·89	5·49	—	—
1896–1900	—	—	—	—	2·12	2·57	4·69	—	—
1901–05	—	—	—	—	1·95	2·32	4·27	1·29	5·56
1906–10	—	—	—	—	1·56	2·18	3·74	1·26	5·00
1911–15	1·42	2·61	4·03	0·99	1·50	2·31	3·81	1·21	5·02
1916·20	1·51	2·61	4·12	1·68	1·59	2·29	3·88	1·92	5·80
1921–25	1·40	2·50	3·90	1·14	1·48	2·21	3·69	1·35	5·04
1926–30	1·73	2·54	4·27	1·24	1·78	2·23	4·01	1·50	5·51
1911 ..	1·43	2·44	3·87	1·04	1·52	2·15	3·67	1·24	4·91
1912 ..	1·39	2·59	3·98	0·97	1·47	2·31	3·78	1·17	4·95
1913 ..	1·26	2·70	3·96	0·91	1·34	2·37	3·71	1·16	4·87
1914 ..	1·55	2·62	4·17	0·95	1·63	2·32	3·95	1·17	5·12
1915 ..	1·47	2·71	4·18	1·09	1·56	2·38	3·94	1·38	5·27
1916 ..	1·38	2·74	4·12	0·94	1·47	2·40	3·87	1·19	5·06
1917 ..	1·31	2·58	3·89	0·95	1·39	2·27	3·66	1·18	4·84
1918 ..	1·28	2·51	3·79	3·81	1·35	2·20	3·55	4·05	7·60
1919 ..	1·67	2·70	4·37	1·93	1·76	2·36	4·12	2·18	6·30
1920 ..	1·81	2·52	4·33	1·13	1·87	2·25	4·12	1·34	5·46
1921 ..	1·38	2·53	3·91	1·09	1·46	2·25	3·71	1·29	5·00
1922 ..	1·38	2·43	3·81	1·35	1·46	2·12	3·58	1·58	5·16
1923 ..	1·30	2·51	3·81	1·01	1·38	2·22	3·60	1·22	4·82
1924 ..	1·39	2·51	3·90	1·16	1·48	2·22	3·70	1·36	5·06
1925 ..	1·56	2·52	4·08	1·07	1·62	2·24	3·86	1·29	5·15
1926 ..	1·60	2·52	4·12	1·02	1·64	2·23	3·87	1·27	5·14
1927 ..	1·57	2·54	4·11	1·32	1·63	2·20	3·83	1·60	5·43
1928 ..	1·79	2·63	4·42	1·20	1·85	2·30	4·15	1·47	5·62
1929 ..	1·80	2·53	4·33	1·49	1·83	2·24	4·07	1·75	5·82
1930 ..	1·92	2·48	4·40	1·19	1·96	2·19	4·16	1·43	5·59
1931 ..	1·66	2·45	4·11	1·44	1·71	2·22	3·93	1·62	5·55
1932 ..	1·61	2·60	4·21	1·16	1·68	2·33	4·01	1·36	5·37
1933 ..	1·83	2·68	4·51	1·43	1·90	2·42	4·32	1·62	5·94

* 828 deaths in 1933 (Table LXV).

† 828 deaths in Table LXV, 112 from puerperal nephritis and albuminuria, and 1 from puerperal tetanus in 1933.

‡ See last paragraph on page 98 with reference to the meaning of this rate.

Table 5 for each puerperal cause, but from 1931 rates based upon the total births registered in each year have been substituted (Table 7). Rates of mortality from combined puerperal causes per 1,000 live births have been given in the text of the Reports since 1902, and in Table LXXII such rates are given from 1891–95 according to the classification in use prior to 1911, and from 1911 onwards according to both the old and revised systems.

Reliable statistics of stillbirths have been available since 1928, and as the total births, *i.e.*, live and still births, provide a closer approximation to the number of women exposed to the risk of dying from puerperal conditions than do live births alone, maternal mortality rates have been calculated since that year on both bases, and will continue to be so calculated for a sufficient period to enable statistical continuity to be assured. It will be observed from Table LXXIII that while the rates on the wider basis are naturally lower than those based on live births the relative changes from year to year remain practically unchanged.

Since the mortality assigned to causes No. 144–150 (that is to say, causes other than abortion, ectopic gestation or other accidents of pregnancy) occurs almost entirely in women whose pregnancy has lasted 28 weeks or over, the women at risk of death from these causes would properly be measured by the number of confinements resulting during the year in one or more live or stillbirths *plus* the number of women who died from these causes undelivered *plus* the number of women pregnant over 28 weeks who died from other causes without childbirth supervening. The number in the second category must be small compared with the total deaths from causes No. 144–150, and the number in the last category having no mention of pregnancy on the certificate, which would consequently escape inclusion in Table LXVII, may be presumed to be small compared with the number of deaths after the 28th week of pregnancy which are recorded in that table. It follows that the number at risk to be added to the live and still birth confinements will be less than the total deaths assigned to groups No. 144–150 plus those deaths included in Table LXVII which were not associated with abortion, which would mean an *addition* of 2,859 in 1933, or of 5 per 1,000 to the number of live and still births in the year (605,497). On the other hand, owing to multiple births, the number of confinements resulting in a live or still birth is about 1 per cent. less than the total of all the births registered, which would necessitate a *deduction* of that order from the total live and still births. It may be contended, however, that since the mortality risk is greater in a multiple confinement, the number of births gives as good a measure of the exposures to risk as the number of confinements resulting in those births.

The amount of the net correction of mortality rates for all these factors would be so small and would vary so little from year to year or from place to place that its effect on any comparisons between

rates would be inappreciable, and the calculation of maternal mortality from causes No. 144–150 upon the simple total of live and still births is a practical expedient which seems open to little objection.

Ectopic gestation (No. 142) and other accidents of pregnancy other than abortion (No. 143), which are events presumably tending to occur in a constant proportion of pregnancies from causes not usually under control, may also be related to the births without serious objection as giving an approximate relative measure from year to year or from place to place, though not an absolute measure, of the total pregnancies.

It may be urged with some force, however, that with regard to abortion there is less justification for calculating mortality rates from this cause on the basis of the number of live and still births. The risk of death from abortion is a function of the number of abortions, and there is no particular reason to suppose, since natural processes are allowed to have less complete control than formerly in the matter of child-bearing, that the number of abortions has been falling in recent years in proportion to the number of births, nor indeed that the number has necessarily been falling at all. In the absence of knowledge as to the number of abortions, it would seem reasonable to relate the abortion deaths to the number of women of reproductive age in the population, and to calculate an abortion rate on this basis, together with a maternal mortality rate excluding abortion based on the births.

The various rates of mortality calculated on these different bases for comparability with rates in past and future years are given in Tables LXXIII–LXXVII, the principal rates being collected together

Table LXXIII.—Mortality of Women in or associated with child-birth, 1928–33.

	—	1928.	1929.	1930.	1931.	1932.	1933.
Per 1,000 Live Births	Puerperal sepsis	1·79	1·80	1·92	1·66	1·61	1·83
	Other puerperal causes	2·63	2·53	2·48	2·45	2·60	2·68
	Total puerperal mortality	4·42	4·33	4·40	4·11	4·21	4·51
	Non-puerperal causes†	1·20	1·49	1·19	1·44	1·16	1·43
Per 1,000 Live and Still-births.	Puerperal sepsis	1·72	1·73	1·84	1·59	1·55	1·75
	Other puerperal causes	2·52	2·43	2·38	2·35	2·49	2·57
	Total puerperal mortality	4·25	4·16	4·22	3·95	4·04	4·32
	Non-puerperal causes†	1·15	1·43	1·14	1·38	1·11	1·37
	Puerperal causes other than abortion	3·74	3·63	3·59	3·42	3·45	3·70
	Non-puerperal causes, excluding deaths associated with abortion.	1·03	1·25	1·03	1·27	0·97	1·21
Per 1,000,000 women aged 15–45.	Abortion (including criminal)	42	43*	50*	43*	46*	47*
	Non-puerperal causes associated with abortion.	9	12§	8	8	9	10

NOTE.—Criminal abortion deaths are not included in any of the above rates except where specified.

† Associated with pregnancy or child-bearing.

* If corrected for puerperal sepsis deaths having no statement as to duration of pregnancy (see text) the estimated rates for 1929 to 1933 are raised to 46, 53, 46, 47, 50, and the residual rates in the line above are decreased by about 0·04 per 1,000.

§ Corrected in accordance with the note below Table LXVIII.

in Table LXXIII. If based upon live births only, the rate of puerperal mortality (including abortion other than criminal) was 4·51 per 1,000, this rate being useful for comparison with years prior to 1928 (Tables LXXII–LXXIV, LXXVII).

Table LXXIV compares the mortality per 100,000 live births in 1933 with that in 1926–30, 1931 and 1932 from the constituent headings of the group of puerperal causes other than abortion, and where possible, with that in 1911–20. The causes which are increasing are notably ectopic gestation and the group of "other accidents of childbirth." Placenta prævia, other puerperal hæmorrhage, the combined rate for albuminuria and the "other toxæmias," and the puerperal sepsis rate excluding post-abortive sepsis, show little change from the mean rates during 1926–30.

Table LXXIV.—Puerperal Mortality from various Causes, per 100,000 Live births, 1911–20, 1926–30, 1931, 1932 and 1933.

List No.		1911–20.	1926–30.	1931.	1932.	1933.
142	Ectopic gestation	9	13	12	14	16
143	Other accidents of pregnancy ..	?	3	4	3	4
144*a*	Placenta prævia	55	24	22	25	24
b	Other puerperal hæmorrhage ..		26	24	22	23
146	Puerperal albuminuria & convulsions	79	79	59	61	64
147	Other toxæmias of pregnancy ..	?	8	21	25	24
148	Puerperal phlegmasia alba dolens, embolism and sudden death	37	29	29	32	30
149	Other accidents of childbirth ..	?	41	47	47	54
150(1)	Puerperal insanity	4	3	2	4	2
(2)	Puerperal diseases of breast.. ..	1	1	2	2	3
(3)	Childbirth (unqualified)	?	6	4	6	5
	Total non-septic causes other than abortion.	246	234	227	241	247
145	Puerperal sepsis not returned as abortion.	?	137	130	119	139

The rate per 1,000 total (live and still) births for all puerperal causes is 4·32, compared with an average rate of 4·12 in the preceding five years, or if abortion deaths are excluded the rate is 3·70 compared with an average of 3·57 for 1928–32 (Table LXXIII). The latter rate for causes other than abortion increased from 3·43 and 3·41 in 1926 and 1927 to 3·74 in 1928, declined to 3·42 by 1931 and then increased again (Table LXXV). The rate for non-puerperal causes, associated with pregnancy or childbearing without abortion, is 1·21 per 1,000 total births compared with an average rate of 1·11 in the preceding 5 years; the fluctuations in this rate are largely accounted for by the presence or absence of influenza epidemics.

Table LXXV.—Maternal Mortality from Various Causes other than Abortion per 100,000 Live and Still Births (estimated), and from Abortion per 1,000,000 Women Living, by Age of Mother. 1924–1933.

			1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
Rates per 100,000 Live and Still births (estimated at each age)												
142–150	Diseases of pregnancy, childbirth and the puerperal state, excluding abortion	All ages	?	?	343	341	374	363	359	342	345	370
		15– ..	¼	?	?	?	?	?	?	273	242	292
		25– ..	?	?	?	?	?	?	?	321	320	333
		35–45..	?	?	?	?	?	?	?	468	517	544
142	Ectopic gestation	All ages	10	12	13	14	13	13	11	12	13	15
		15– ..	3	5	5	6	5	4	1	4	2	5
		25– ..	10	14	11	15	11	13	11	11	13	15
		35–45..	16	15	25	22	22	22	21	24	25	24
143	Other accidents of pregnancy (not abortion)	All ages	3	3	3	4	2	2	2	3	3	4
		15– ..	2	—	2	2	2	1	1	3	2	5
		25– ..	2	2	2	3	2	2	2	2	3	2
		35–45..	3	6	4	5	1	4	4	7	5	2
144	Puerperal hæmorrhage ..	All ages	51	50	47	48	48	47	51	44	45	44
		15– ..	18	24	19	21	24	16	24	21	18	17
		25– ..	43	42	41	40	41	38	45	39	38	39
		35–45..	101	96	87	96	90	101	96	84	95	89
145	Puerperal sepsis not returned as post-abortive	All ages	?	?	123	119	140	138	140	125	114	133
		15– ..	?	?	?	?	?	?	?	116	91	111
		25– ..	?	?	?	?	?	?	?	118	115	127
		35–45..	?	?	?	?	?	?	?	151	130	170
146	Puerperal albuminuria and convulsions	All ages	69	67	72	79	81	78	69	57	58	61
		15– ..	81	75	71	70	76	77	57	61	62	63
		25– ..	53	58	61	73	67	70	62	49	47	52
		35–45..	90	77	96	100	117	98	98	70	82	82
147	Other toxæmias of pregnancy	All ages	7	8	8	7	7	10	10	20	24	23
		15– ..	8	10	13	6	8	11	13	18	19	29
		25– ..	6	7	6	8	5	9	8	20	22	18
		35–45..	9	7	7	5	8	12	11	20	31	28
148	Puerperal phlegmasia alba dolens, embolism and sudden death	All ages	32	32	28	26	32	27	28	29	31	29
		15– ..	14	23	14	11	15	10	16	16	16	16
		25– ..	31	29	28	25	29	27	26	30	25	24
		35–45..	49	49	42	43	56	46	45	40	65	58
149	Other accidents of childbirth	All ages	31	33	38	37	45	41	36	46	45	51
		15– ..	22	24	22	19	25	27	20	27	28	40
		25– ..	26	27	34	37	40	38	33	46	44	47
		35–45..	47	57	62	52	77	64	60	61	66	76
150	Other or unspecified conditions of the puerperal state (not abortion) ..	All ages	14	15	12	8	8	8	12	7	12	9
		15– ..	6	8	9	8	7	7	5	7	5	7
		25– ..	13	12	10	6	7	7	13	5	12	8
		34–35..	26	29	19	10	10	11	18	12	19	15
	Deaths assigned to other causes but associated with pregnancy and childbirth (not abortion)	All ages	?	?	?	?	103	125	103	127	97	121
		15– ..	?	?	?	?	71	77	52	71	61	79
		25– ..	?	?	?	?	87	113	91	107	83	106
		35–45..	?	?	?	?	172	204	191	239	176	199
Rates per million women living at the age in question (estimated)												
140	Post-abortive sepsis ..	15–45..	?	?	23	22	23	24	31	23	27	26
		15– ..	?	?	?	?	?	?	?	11	13	12
		25– ..	?	?	?	?	?	?	?	34	37	35
		35–45..	?	?	?	?	?	?	?	25	29	31
141	Abortion not returned as septic	15–45..	19	16	16	16	13	12	13	12	12	12
		15– ..	4	3	4	4	2	3	2	3	2	3
		25– ..	24	19	22	20	18	15	14	16	15	13
		35–45..	29	28	24	24	18	20	24	16	19	21
	Criminal abortion	15–45..	4	7	5	5	6	7	7	8	7	9
		15– ..	3	5	3	4	3	5	3	4	5	6
		25– ..	4	10	9	7	10	11	11	13	13	13
		35–45..	4	6	4	4	4	4	6	7	3	6
	Deaths assigned to other causes but associated with abortion	15–45..	?	?	?	?	9	12	8	8	9	10
		15– ..	?	?	?	?	2	6	3	3	4	3
		25– ..	?	?	?	?	13	19	11	12	12	15
		35–45..	?	?	?	?	10	11	10	10	13	12

Table LXXVI.—Mortality of Married Women at Separate ages from Various Puerperal Causes other than Abortion (per 100,000 Births—live and still); and of Married and Single Women from Abortion (per 1,000,000 living), 1930–32 and 1933.

List No.			Deaths of Married Women per 100,000 Legitimate Live and Still Births.			
			All ages.	15–25.	25–35.	35–45.
142–150	Diseases of pregnancy, childbirth, etc., excluding abortion	1930–32	343	255	318	482
		1933 ..	363	291	325	519
142	Ectopic gestation	1930–32	12	2	11	22
		1933 ..	14	3	15	22
143	Other accidents of pregnancy (not abortion)	1930–32	3	2	2	5
		1933 ..	3	5	2	2
144	Puerperal hæmorrhage	1930–32	47	21	39	89
		1933 ..	45	19	39	84
145	Puerperal sepsis not returned as post abortive	1930–32	124	109	121	143
		1933 ..	131	112	125	161
146	Puerperal albuminuria and convulsions ..	1930–32	56	54	48	74
		1933 ..	60	61	51	79
147	Other toxæmias of pregnancy	1930–32	20	17	19	25
		1933 ..	21	27	16	28
148	Puerperal phlegmasia alba dolens, embolism and sudden death	1930–32	29	16	27	49
		1933 ..	29	16	23	57
149	Other accidents of childbirth	1930–32	42	27	40	59
		1933 ..	50	39	46	72
150	Other or unspecified conditions of the puerperal state (not abortion)	1930–32	10	6	10	16
		1933 ..	10	7	8	15
	Deaths assigned to other causes but associated with Nos. 142–150	1933 ..	118	75	103	189

			Deaths of Married Women per Million living at ages			Deaths of Single Women per Million living.		
			15–25.	25–35.	35–45.	15–25.	25–35.	35–45.
140	Post-abortive sepsis	1930–32	55	53	43			
		1933 ..	46	49	38	7	6	7
141	Abortion not returned as septic	1930–32	10	22	25			
		1933 ..	14	18	26	1*	4*	2*
—	Criminal abortion	1930–32	12	14	5			
		1933 ..	17	13	6	4	11	—
—	Total of above	1930–32	77	89	66			
		1933 ..	77	79	70	12	20	9
—	Deaths assigned to other causes but associated with No. 140–141	1933 ..	17	21	15	—	4*	2*

* Note.—These rates are based upon less than 5 deaths.

Mortality attributed to abortion, including criminal cases, is 47 per million women aged 15–45, compared with average rates of 43 in 1926–28 and 45 in 1929–31, and a rate of 46 in 1932 (Tables LXXIII, LXXV). Abortion with sepsis accounts for 26 deaths per million women of childbearing age (23 in 1926–28, 26 in 1929–31, 27 in 1932) and criminal abortion for 9 (5 in 1926–28, 7 in 1929–31,

7 in 1932). The rate for non-puerperal causes associated with abortion is 10, compared with an average of 9 in the preceding 5 years.

Table LXXV gives the rates of mortality per 100,000 total births to women of various ages from separate causes in each year since 1924. The numbers of live and still births to women of specific ages have been estimated by means of the fertility rates (for live births) at various ages calculated in the census years 1921 and 1931 and given in Table LXXXVIII of the Review for 1932. The rates for years between 1921 and 1931 are first estimated by simple interpolation assuming equal decrements of fertility at a given age to have occurred in each year. By applying these to the estimated populations of married and of single women in the year, and adjusting the resulting expected live births to equal in aggregate the actual total of registered live and still births in the year in question, the required numbers of live and still births at each age of mother are obtained. The assumption is necessarily made that all births occur within the age limits 15–45, an approximation which results in a slight depression of all the rates, and it is also assumed that still births form a constant ratio to live births regardless of age. The errors involved in these assumptions are so small in effect that they may be disregarded. For years since 1931 the fertility rates of that year have been applied, and the calculated total then adjusted as before to the realised total, this being tantamount to assuming that since 1931 fertility has changed to an equal relative extent at each age, this being the simplest assumption in the absence of data. Owing to the progressive uncertainty of estimates both of the married and single populations and of the fertility rates with increasing interval from the census, the calculation of the rates in Tables LXXV–VI can only be carried on for a few years unless, as is hoped, data of age of mother from birth registration becomes available to replace the numbers of births estimated by this method.

The specific age rates for the abortion and other than abortion components of puerperal sepsis cannot be calculated separately prior to 1931, but the combined rates for both forms of puerperal sepsis per 100,000 total births at the stated age have been as follows in the ten years 1924 to 1933.

	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
All ages	134	150	154	151	172	173	184	159	155	175
15–25	110	133	131	118	139	146	139	141	119	139
25–35	122	136	146	141	160	167	179	150	151	163
35–45	182	190	193	201	238	216	242	207	198	246

At ages 15–25 the average of the sepsis rates in the 5 years 1924–28 was 126, and in 1929–33 it was 137, or 9 per cent. higher; at 25–35 the quinquennial averages were 141 and 162, an increase of 15 per cent., and at 35–45 they were 201 and 222, an increase of 10 per cent. The rates of 1933 were equalled or exceeded at

ages 15–25 in each year 1928 to 1931, at 25–35 in 1929–30 only, and at 35–45 not in any of the preceding 9 years. Sudden increases in the sepsis rates are evident in 1925, 1928 and 1933, and pronounced downward movements in 1931 or 1932.

Table LXXV shows that there has been no consistent change in the rate for puerperal sepsis not returned as post-abortive since 1926, the first year for which it can be calculated; the average rate in 1926–29 was 130 per 100,000 births and in 1930–33 it was 128. Amongst married women alone (Table LXXVI) this rate, based upon legitimate births only, is slightly lower than amongst all women (the successive rates in 1928 to 1933 being 137, 136, 137, 123, 113, 131); in 1930–32 the rates were 109 at 15–25, 121 at 25–35 and 143 at 35–45, the corresponding rates in 1933 being 112, 125 and 161.

Despite the decline in fertility, the death rates from post-abortive sepsis per million women living have tended to increase, the average of the rates during 1926–29 being 23, and during the last 4 years 27. This rate is not greatly influenced by age either in single or married women (Table LXXVI), though when based upon the whole population of women it naturally changes with age owing to the changing proportion of the married as age advances. The rates amongst the married were lower in 1933 than in 1930–32 at each age. The total death rates attributed to abortion (including criminal cases) per million married women in 1930–32 were 77 at ages 15–25, 89 at 25–35 and 66 at 35–45; in 1933 the rates were lower at ages under 35. The estimated rates per million single women at the corresponding ages in 1933 were 12, 20 and 9 (Table LXXVI).

Puerperal hæmorrhage tends to decline slightly, the average of the rates in 1931–33 amongst all women being 19, 39 and 89 per 100,000 births at the three ages, compared with 20, 42 and 95 in 1924–26. This is also true of puerperal albuminuria and convulsions, the averages for 1931–33 being 62, 49, 78 at the three ages, compared with 76, 57, 88 for 1924–26, but this decline is offset by the increase of rates for other toxæmias of pregnancy from 10, 6, 8 in 1924–26 to 22, 20, 26 in 1931–33. The increase in mortality rates assigned to " other accidents of childbirth," from average rates of 22, 33, 59 in 1924–28 to 28, 42, 65 in 1929–33, is also partly offset by a fall in the rates for other or unspecified conditions owing to greater precision in certification.

The distribution throughout the country of the mortality ascribed to childbirth is outlined in Table LXXVII. Sepsis mortality was higher, in the towns than the rural districts, and, as in the preceding year, the London rate was lower than that of the rural aggregate. The sepsis rate was highest in North II, I and III, Wales coming next in order; the East gave the lowest rate.

Mortality from non-septic causes was highest in the small towns and lowest in London, the latter rate being the lowest in the table,

as in 1931 and 1932. Wales registered the highest rates, followed by North II, III and IV. The range of regional variation was, as usual, less for septic than non-septic causes.

Table LXXVII—Distribution throughout England and Wales of Mortality of Women in Childbirth, distinguishing Septic and Other Causes, and of Prevalence of Puerperal Fever and Pyrexia, 1933.

	Per 1,000 Live Births.					Per 1,000 Live and Still Births.					"Puerperal Fever" Cases per 100 Deaths.
	Deaths.			Cases.		Deaths.			Cases.		
	Sepsis.	Other causes.	Total.	"Fever."	"Pyrexia."	Sepsis.	Other causes.	Total.	"Fever."	"Pyrexia."	
England and Wales ..	1·83	2·68	4·51	3·6	10·0	1·75	2·57	4·32	3·5	9·6	197
South-East	1·66	2·20	3·86	3·7	11·0	1·61	2·13	3·73	3·6	10·7	225
Greater London ..	1·77	2·06	3·83	4·1	12·7	1·72	1·99	3·71	3·9	12·3	229
Remainder of South-East..	1·49	2·41	3·90	3·3	8·5	1·44	2·33	3·77	3·1	8·2	218
North	2·02	3·19	5·21	3·6	9·9	1·93	3·04	4·97	3·4	9·5	179
North I	2·27	2·71	4·98	2·7	7·8	2·18	2·60	4·77	2·6	7·5	119
„ II	2·32	3·53	5·85	3·1	8·1	2·21	3·37	5·58	3·0	7·7	133
„ III	2·22	3·50	5·72	4·1	10·4	2·12	3·33	5·45	3·9	9·9	184
„ IV	1·73	3·14	4·87	3·9	11·0	1·65	2·99	4·64	3·7	10·5	224
Midland	1·83	2·16	4·00	3·3	9·5	1·76	2·07	3·83	3·2	9·1	181
Midland I	1·94	2·04	3·98	3·7	9·9	1·86	1·96	3·82	3·5	9·5	191
„ II	1·63	2·40	4·03	2·6	8·8	1·56	2·30	3·86	2·5	8·4	160
East	1·40	2·46	3·86	3·5	9·3	1·35	2·37	3·71	3·4	8·9	251
South West	1·45	2·76	4·21	3·3	10·4	1·39	2·64	4·03	3·1	10·0	225
Wales	2·18	3·91	6·09	4·0	6·9	2·06	3·69	5·75	3·8	6·5	184
Wales I	2·20	3·85	6·05	4·4	7·1	2·07	3·64	5·71	4·2	6·7	202
„ II	2·14	4·07	6·21	2·7	6·3	2·01	3·84	5·85	2·6	5·9	129
County Boroughs* ..	1·89	2·58	4·47	4·7	11·5	1·81	2·47	4·27	4·5	11·0	248
Other Urban Districts*	1·85	3·01	4·87	2·8	8·6	1·77	2·88	4·65	2·7	8·2	152
Rural Districts*.. ..	1·74	3·00	4·74	2·5	6·9	1·67	2·87	4·55	2·4	6·6	143
Greater London Admin. County	1·69	1·97	3·67	4·5	14·8	1·64	1·91	3·54	4·4	14·3	267
Greater London Outer Ring ..	1·86	2·14	4·00	3·6	10·5	1·80	2·07	3·87	3·5	10·1	193

* Excluding Greater London.

Puerperal fever notification.—The records of cases of puerperal fever and pyrexia notified are collated with those of births and of deaths from this cause in Table LXXVII. The proportion to live births of puerperal fever cases notified is 36 per 10,000. This rate rose from 30 in 1927 to 40 in 1930, and fell to 35 in 1932, and may have been affected by the compulsory notification of "puerperal pyrexia," which was in force throughout the period, having commenced on October 1, 1926. The records of notifications under both headings will be found in Tables 28–29 in full detail of locality. The highest fever rates were recorded for Wales I, North III and Greater London, the pyrexia rates being highest in Greater London, North IV and the South West. The fever rate was lowest in Midland II, and the pyrexia rate in Wales II.

The proportion of puerperal fever cases to sepsis deaths is lowest in North I and II and in Wales II as in 1932, and highest in the East, Greater London and the South West, the range of variation in the regions being from 119 to 251 cases notified per 100 deaths. In London the ratio was 267.

186. **Crushing by Motor Vehicles (not on railways).**—Apart from 397 deaths on railways and 49 caused by aircraft, there were 5,934 accidental deaths attributed to mechanically-propelled vehicles in 1933, 4,447 of males and 1,487 of females. The rate of mortality per million persons was 147 compared with 141 in 1932, 147 in 1931 and 159 in 1930. In Table LXXVIII, the allocation of deaths to the different types of mechanically-propelled road vehicles is shown. The deaths classified as " Others " in 1933 are made up as follows :—

> Motor cab, 41; motor char-a-banc, 61; motor tractor, 1; steam roller, 3; other or undefined motor, 7, and collisions involving a motor vehicle without statement as to which of the vehicles caused the death, 1,416.

It is regrettable that the last of these items is so large, since the lack of specification of the vehicle causing death renders the analysis of Table LXXVIII less complete than it would otherwise have been. It is also regrettable that the distinction between the occupants of vehicles and pedestrians or cyclists cannot always be made from the records of death certification, nor do the records furnish the information necessary for a satisfactory analysis of deaths according to the locality in which the accident occurred.

Table LXXVIII.—Deaths, and Death Rates per Million Living, caused by various Types of Road Motor Vehicles in each year—1928–33.

	Deaths.						Rate per Million Living.					
	1928.	1929.	1930.	1931.	1932.	1933.	1928.	1929.	1930.	1931.	1932.	1933.
Electric tram ..	101	89	73	74	52	66	2·6	2·2	1·8	1·9	1·3	1·6
Motor car ..	1,550	1,660	1,643	1,688	1,646	1,773	39·2	41·9	41·3	42·2	40·9	43·9
Motor van, lorry, etc.	938	1,162	1,273	1,209	1,111	1,180	23·8	29·3	32·0	30·2	27·6	29·2
Motor omnibus ..	557	584	692	529	447	421	14·1	14·7	17·4	13·2	11·1	10·4
Motor cycle ..	1,043	1,162	1,286	1,083	983	965	26·4	29·3	32·3	27·1	24·5	23·9
Others	1,007	1,095	1,375	1,309	1,432	1,529	25·5	27·6	34·5	32·7	35·6	37·9
Total motor vehicles	5,196	5,752	6,342	5,892	5,671	5,934	131·6	145·2	159·3	147·3	141·1	147·1

Deaths attributed to the motor omnibus have fallen progressively since 1930, the total registered deaths in the causation of which this type of vehicle was concerned (alone or in collision with some other vehicle) being 852, 699, 595 and 559 in the four years 1930 to 1933. The same applies to the motor cycle, for which the corresponding totals have been 2,091, 1,797, 1,783, 1,727, but for the motor car this total, after remaining almost stationary during 1930–32, rose sharply in 1933 (2,219, 2,257, 2,291, 2,527).

Pedal cycles are known to have been concerned in or responsible for the following accidental deaths :—

		1929.	1930.	1931.	1932.	1933.
Pedal cycles alone	M	207	258	235	308	345
	F	47	61	84	95	105
Pedal cycle in collision with other vehicles ..	M	232	294	309	431	544
	F	23	34	35	49	64
Total (*see* note below Table LXXX) ..	P	509	647	663	883	1,058

DIAGRAM 6. DEATH RATES FROM ACCIDENTS CAUSED BY ROAD MOTOR VEHICLES AT VARIOUS AGES 1931-33.

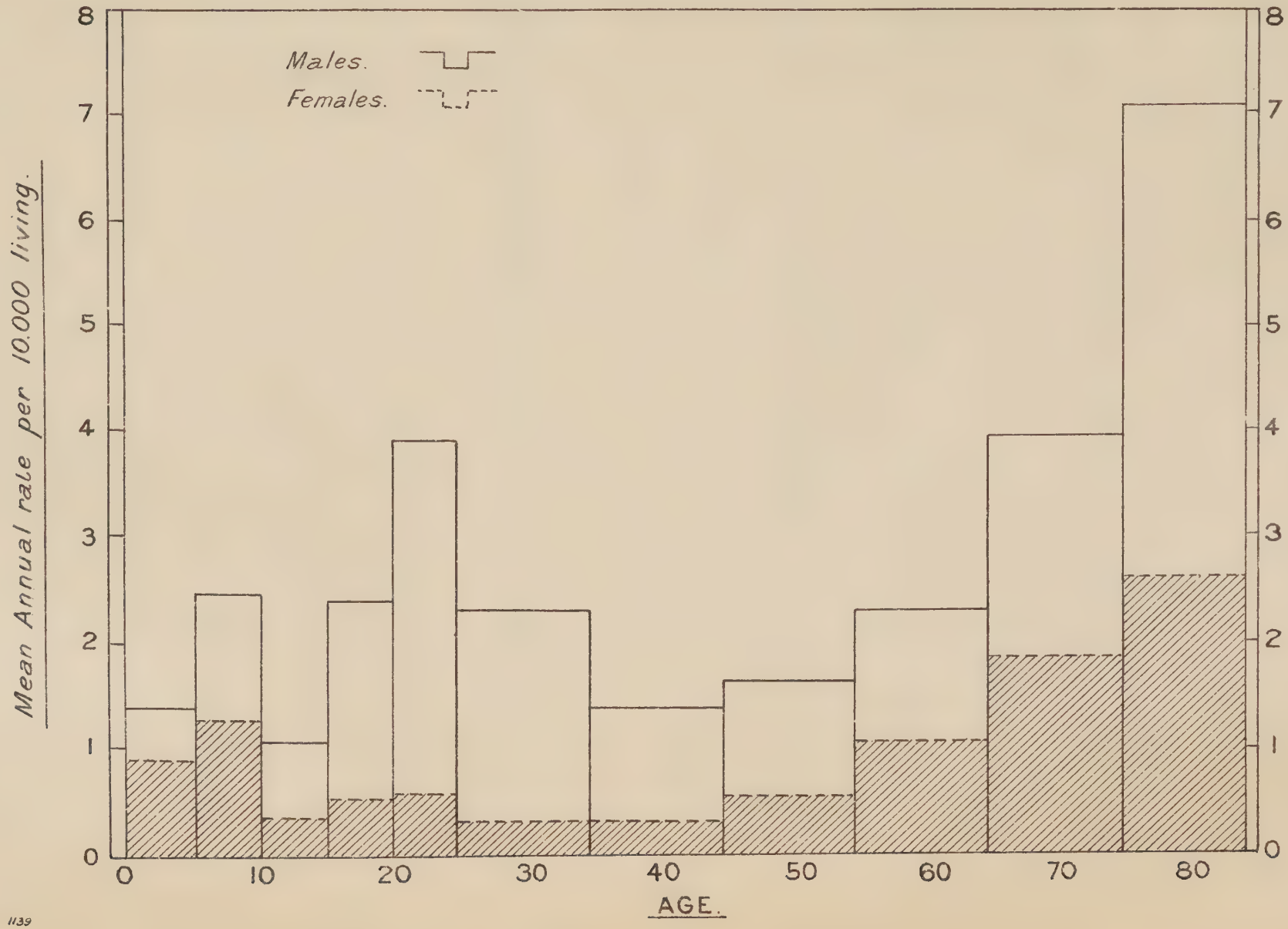

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Table LXXIX compares the mean annual death rates per million living due to accidents caused by all forms of road motor vehicles at various ages in 3 triennial periods 1925–27, 1928–30 and 1931–33. In each of these periods the male rate at all ages has been more than three times the female rate. This excess is present at each age, but the ratio of male to female risk increases with age to a maximum exceeding 7 at 20–25, then declines to about 2 at 55–75 and again increases slightly in old age.

Table LXXIX.—Death rates per Million living from All Accidents caused by Road Motor Vehicles, by Sex and Age. 1925–27, 1928–30 and 1931–33.

	Males.			Females.		
	1925–27.	1928–30.	1931–33.	1925–27.	1928–30.	1931–33.
0–	107	142	143	55	87	88
5–	195	250	242	92	129	133
10–	102	132	106	26	40	37
15–	151	231	238	32	50	52
20–	233	365	393	30	57	55
25–	146	221	228	22	31	33
35–	112	147	142	23	33	33
45–	134	166	160	36	57	53
55–	170	239	228	75	95	104
65–	301	400	395	140	190	186
75 and over ..	490	738	711	179	276	260
All ages	159	226	225	48	71	72

From 1925–27 to 1928–30 the male rate at all ages rose by 42 per cent. and the female rate by 48 per cent. The changes which took place in the mean rates from 1928–30 to 1931–33 were, however, remarkably slight, the female rates remaining almost unchanged at each age under 45, whilst the male rates showed a rise for young adults balanced by a fall for boys of school age and men over 35.

The graphical representation of the relation of mortality rates with age in Diagram 6 clearly indicates the existence of 3 ages of maximal risk, the composite curve being the resultant of the various curves for pedestrians, cyclists and occupants of motor vehicles (which are unfortunately inseparable). These three ages of maximal risk are the age of commencing pedestrian activity uncontrolled by experience, 5–10, the age of great motor driving activity not fully restrained by a sense of responsibility, 20–25, and old age with its physical inability to escape many traffic dangers.

The trend of mortality risks according to age for pedestrians separately in 1933 has been analysed for Great Britain as a whole in the Ministry of Transport's Report on Fatal Road Accidents in that year, and also the numbers of deaths at various ages of motor cyclists and pedal cyclists. The numbers of deaths of pedestrians

resulting from road accidents which were reported to the police during the year, per million total population estimated in Great Britain at each age, as taken from that Report, were as shown below :

Age.	Males.	Females.	Age.	Males.	Females.	Age.	Males.	Females.
0– ..	149	81	30– ..	33	13	60– ..	184	118
5– ..	219	137	35– ..	33	18	65– ..	295	141
10– ..	44	26	40– ..	48	23	70– ..	432	213
15– ..	30	15	45· ..	69	32	75– ..	664	234
20– ..	23	16	50– ..	85	47	80– ..	938	390
25– ..	14	11	55– ..	113	78	85– ..	896	279

At the two ends of life these rates approximate to the mortality rates for 1931–33 comprising all males or females registered as dying as a result of motor accidents in England and Wales (Table LXXIX), but at intermediate ages they bear a ratio to the latter which becomes minimal at ages 20–25 and then increases.

Table 25 analyses according to sex and age the accidental deaths caused by each type of vehicle, and in Table LXXX those caused by the more important motor road vehicles, and also by pedal cycles, during 1931–33 are classified by sex and age. In this table a group of collisions in which a pedal cycle was involved together with another vehicle is shown separately from other collisions but as explained in the note below the table this group does not comprise all such accidents, some being included in other groups.

Table LXXX.—Accidental Deaths* caused by Various types of Road Motor Vehicles and by Pedal Cycles, by Sex and Age. 1931–33.

		All ages.	0–	5–	10–	15–	20–	25–	35–	45–	55–	65–	75 & up.
Electric tram	M	125	4	5	3	3	2	8	10	17	24	29	20
	F	67	1	2	1	—	2	2	4	3	12	16	24
Motor-car	M	3,307	197	426	117	138	224	325	239	348	456	489	348
	F	1,800	133	235	59	56	78	121	105	199	305	314	195
Motor-van, lorry ..	M	2 512	288	488	185	195	182	224	174	180	250	223	123
	F	988	146	252	56	37	32	33	39	73	105	135	80
Motor omnibus	M	903	96	143	64	67	53	78	79	88	85	95	55
	F	494	56	93	26	27	20	30	39	39	69	71	24
Motor cycle	M	2,424	43	49	13	218	675	643	185	133	162	181	122
	F	607	33	18	6	47	78	67	52	50	94	98	64
†Collisions involving pedal cycle	M	1,284	1	22	129	258	168	210	131	141	143	70	11
	F	148	—	5	19	38	28	22	12	15	6	3	—
†Other collisions	M	2,160	5	6	15	277	687	649	239	160	76	36	10
	F	259	7	6	9	41	51	53	34	25	18	12	3
Other mechanical road transport.	M	272	14	34	16	16	12	26	23	38	38	39	16
	F	147	10	21	7	9	3	10	8	15	21	26	17
Total	M	12,987	648	1,173	542	1,172	2,003	2,163	1,080	1,105	1,234	1,162	705
	F	4,510	386	632	183	255	292	338	293	419	630	675	407
Pedal cycle	M	888	3	21	67	140	81	96	82	81	117	106	94
	F	284	5	10	8	20	23	10	10	26	47	74	51

* Including "open verdicts."

† Comprising only those collisions where it is not known which of the vehicles actually caused death; where this is known the collision is included under the appropriate heading.

The proportion of male to female deaths varies considerably according to the vehicle causing death and according to age, the percentage ratios being as follows :—

	All Ages.	0–5.	5–15.	15–25.	25–45.	45–65.	65 and over.
Motor car	184	148	185	270	250	160	164
Motor bus	183	171	174	255	228	160	158
Motor van, lorry	254	197	219	546	553	242	161
Pedal cycle	313	?	489	514	890	271	160
Motor cycle	399	130	258	714	696	205	187
Collisions between pedal cycle and other vehicle ..	868	?	629	645	1,003	1,352	2,700

Male excess of deaths is greatest for collisions involving a pedal cycle, motor cycle accidents coming next, and is least for motor car and bus accidents. Even at the early age of 0–5 years the greater risks taken by boys than girls in street play are reflected in the excess of 97 and 71 per cent. for fatalities caused by commercial vehicles and buses respectively and the smaller excess of 48 and 30 per cent. for motor car and motor cycle fatalities, the excess of boys over girls in the population at this age being only 2 per cent. At 5–15 the male excess is greater than at 0–5 for each vehicle, fatalities in which pedal cycles were involved being 5 or 6 times as frequent for boys as for girls, whilst those due to other vehicles were about twice as frequent. The much greater participation of young adult males in the driving of motor cycles and commercial vehicles, and in the riding of pedal cycles, results in male deaths numbering 5 to 10 times the female deaths at 15–45, after which age the contrasts become gradually less except for collisions involving pedal cycles (in which the rider is generally the victim).

Table LXXXI compares the age distributions of deaths, per 1,000 of all ages, in 1931–33 with the corresponding distributions in 1925–30. The quinquennium of age having the greatest number of deaths is 20–25 for accidents involving motor cycles and 5–10 for other types of motor vehicles. For deaths caused by pedal cycles the decennium of age having the greatest number of deaths is 15–25 for males and 65–75 for females, whilst for deaths due to collision involving a pedal cycle 15–25 contributes the greatest mortality for each sex. The distributions of the populations by age, given at the foot of the table, indicate the extent to which the proportions at risk differed in the two periods.

Out of 1,000 male deaths caused by all motor vehicles those of boys at the school ages 5–15 numbered 158 in 1925–30 and 132 in 1931–33, whilst for motor cars alone the proportion fell from 221 to 164 and for motor cycles from 33 to 25. The decline in death rate of boys at ages 10–15 since 1928–30, shown in Table LXXIX, together with these comparisons, seems to indicate that the recent school instruction of boys in the matter of avoiding street accidents has been effective in reducing their excessive liability to these fatalities. Out of 1,000 female deaths caused by motor cars those

Table LXXXI.—Accidental Deaths at Various Ages Caused by Different Types of Road Vehicles, per 1,000 at all ages. 1925–30 and 1931–33.

	Sex.	Period.	All ages.	0–	5–	10–	15–	20–	25–	35–	45–	55–	65–	75 and up
Deaths caused by—														
Electric tram	P	1925–30	1,000	58	45	13	17	26	58	84	132	147	234	186
		1931–33	1,000	26	36	21	16	21	52	73	104	187	235	229
Motor car	M	1925–30	1,000	76	172	49	42	56	77	80	108	130	127	83
		1931–33	1,000	60	129	35	42	68	98	72	105	138	148	105
	F	1925–30	1,000	82	166	36	28	34	49	67	111	155	169	103
		1931–33	1,000	74	131	33	31	43	67	58	111	169	175	108
Motor van, lorry ..	P	1925–30	1,000	118	200	98	89	57	77	65	74	89	81	52
		1931–33	1,000	124	212	69	66	61	73	61	72	101	103	58
Motor omnibus	P	1925–30	1,000	98	161	77	90	61	87	75	104	103	96	48
		1931–33	1 000	109	169	64	67	52	77	85	91	110	119	57
Motor cycle	M	1925–30	1,000	17	24	9	98	256	228	93	83	75	73	44
		1931–33	1,000	18	20	5	90	279	265	76	55	67	75	50
	F	1925–30	1,000	68	46	15	91	107	109	56	99	153	159	97
		1931–33	1,000	54	30	10	77	129	110	86	82	155	162	105
All mechanically propelled road vehicles	M	1925–30	1,000	56	105	53	94	143	142	88	94	93	83	49
		1931–33	1,000	50	90	42	90	154	167	83	85	95	90	54
	F	1925–30	1,000	93	152	43	59	63	71	67	98	128	141	85
		1931–33	1,000	86	140	41	57	65	75	65	93	140	149	89
Pedal cycle	M	1931–33	1,000	3	24	76	158	91	108	92	91	132	119	106
	F	1931–33	1,000	18	35	28	70	81	35	35	92	165	261	180
Collisions involving pedal cycle	M	1931–33	1,000	1	17	100	201	131	164	102	110	111	55	8
	F	1931–33	1,000	—	34	128	257	189	140	81	101	41	20	—
Collisions involving motor cycle	M	1931–33	1,000	1	3	8	139	333	305	106	65	26	13	1
	F	1931–33	1,000	21	16	52	183	278	220	110	68	26	16	10
Population per 1,000 at all ages ..	M	1925–30	1,000	87	91	87	95	91	149	131	121	88	45	15
		1931–33	1,000	78	84	88	85	88	164	132	119	94	51	17
	F	1925–30	1,000	79	81	79	87	85	159	143	125	89	51	22
		1931–33	1,000	70	76	79	79	85	162	143	127	96	58	25

at ages 5–15 numbered 202 in 1925–30 and 164 in 1931–33, the corresponding proportions for motor cycles being 61 and 40, but, as Table LXXIX shows, there is no evidence of any recent improvement in the mortality rate for girls of school age when deaths caused by all forms of motor vehicle are combined.

The reduction of the heavy excess mortality of boys over girls since 1925–30 is evidenced by the following ratios of male per 100 female deaths in the two periods, the decline in ratio being greatest at 10–15.

Ages	0–	5–	10–	15–	20–25
1925–30 ..	180	206	362	472	674
1931–33 ..	168	186	296	460	686

Larger proportions of motor car and motor cycle deaths now occur between ages 20 and 35 than formerly (Table LXXXI), the change being greater than can be accounted for by the age distributions of the population. This is doubtless due to the more rapidly increasing use of motor vehicles by young adults than at other ages. The increases noticeable in the proportions at ages over 55 are mainly accounted for by the higher proportion of old people in the populations at risk.

199, 200. **Ill-defined Diseases.**—These headings in the International List of Causes of Death, to which 1,315 deaths have been allocated, exclude the ill-defined diseases of infancy and old age,

Table LXXXII.—Replies to Inquiries respecting Indefinitely Certified Causes of Death, 1933.

Subject of Inquiry.	Replies received.	Replies amplifying previous information.	Deaths allocated as the result of inquiry to certain headings.
Croup	11	10	Diphtheria 1, Laryngismus stridulus 3, Laryngitis 3.
Membranous laryngitis	1	1	Diphtheria 1.
Pyæmia, septicæmia, etc.	175	133	Diseases of the teeth and gums 7, Diseases of the tonsils 19, Puerperal sepsis 3, Diseases of the skin 28.
Tuberculosis.. ..	144	144	Tuberculosis of the respiratory system 88, Tuberculosis of central nervous system 5, Tuberculosis of intestines and peritoneum 6, Tuberculosis of vertebral column 7, Tuberculosis of other bones and joints 4, Tuberculosis of skin and subcutaneous tissues 2, Tuberculosis of lymphatic system 7, Disseminated tuberculosis 8, Other forms of tuberculosis 5.
Cancer (part or organ not stated).	1,189	1,118	Part or organ stated in 1,092 cases.
Cerebral tumour (P.M. cases).	281	256	Tuberculosis of central nervous system 3, Cancer 133, Glioma 60.
Tumour of other sites	847	644	Syphilis 6, Cancer 477.
Rheumatism.. ..	602	600	Rheumatic fever 192, Chronic rheumatism 2, Rheumatoid arthritis 2, Rheumatic heart disease 396.
Encephalitis.. ..	217	179	Influenza 25, Polioencephalitis 4, Encephalitis lethargica 69, Tuberculosis of central nervous system 2, Syphilis 10, Other forms of encephalitis 26.
Basal or basic meningitis.	19	15	Cerebro-spinal fever 2, Tuberculosis of central nervous system 4, Meningitis—other forms 4.
Posterior or post basal or post basic meningitis.	33	29	Cerebro-spinal fever 19, Tuberculosis of central nervous system 2, Meningitis—other forms 3.
Cerebro-spinal meningitis	119	112	Cerebro-spinal fever 97, Tuberculosis of central nervous system 1, Meningitis—other forms 8.
Spinal sclerosis ..	22	19	Other diseases of the spinal cord 8, Disseminated sclerosis 8.
Cerebral sclerosis ..	7	7	Disseminated sclerosis 2.
Paraplegia	23	15	Syphilis 1, Other diseases of the spinal cord 4, Disseminated sclerosis 2.

Table LXXXII—*continued.*

Subject of Inquiry.	Replies received.	Replies amplifying previous information.	Deaths allocated as the result of inquiry to certain headings.
General paralysis (outside asylums).	16	15	General paralysis of the insane 14.
Paralysis	18	14	Other diseases of the spinal cord 1.
Aortitis, arteritis and endarteritis.	102	88	Syphilis 41, Aneurysm 2, Arterio-sclerosis 2.
Fibroid phthisis ..	77	73	Tuberculosis of respiratory system 60, Chronic interstitial pneumonia 8.
Hæmoptysis	23	18	Tuberculosis of respiratory system 9, Aneurysm 1.
Stomatitis	18	18	Thrush, aphthous stomatitis 1.
Stricture of œsophagus	23	19	Cancer 10.
Hæmatemesis ..	25	19	Cancer 3, Ulcer of stomach or duodenum 10.
Pyloric stenosis, obstruction, etc.	48	43	Cancer 13, Ulcer of stomach or duodenum 24.
Jaundice	41	29	Cancer 4, Biliary calculi 3.
Peritonitis	95	84	Influenza 1, Cancer 9, Ulcer of stomach or duodenum 6, Appendicitis 22, Hernia 2, Intestinal obstruction 4, Puerperal sepsis 5.
Pemphigus of infants	41	36	Syphilis 6.
Hydrocephalus ..	52	46	Cerebro-spinal fever 2, Tuberculosis of central nervous system 2, Congenital hydrocephalus 31.
Violence	457	433	Precise form of suicide 106, Drowning 3, Injury by fall 68, Injury in mines and quarries 27, Injury by crushing 95.
Syncope, Heart Failure.	116	100	Influenza 1, Tuberculosis of respiratory system 2, Diseases of the heart 61, Arterio-sclerosis 5, Bronchitis 5.
Operation	590	561	Cancer 40, Tumours of female genital organs 50, Ulcer of stomach or duodenum 47, Appendicitis 13, Hernia, Intestinal obstruction 44, Biliary calculi 88, Other diseases of the gall bladder 21, Diseases of the prostate 22, Diseases of the female genital organs 38, Congenital malformations 4, Violence 7.
Other indefinite forms of certification.	2,356	1,988	———
Total	7,788	6,866	———

158 and 162 (*b*). In the more comprehensive sense resulting from their inclusion, the deaths from ill-defined causes in 1933 numbered 19,300, or 3·89 per cent. of the total, as compared with 4·19 in 1932 and 9·67 in 1911.

Inquiries sent to medical practitioners and coroners requesting further information as to indefinitely certified deaths amounted to 8,485, and to these 7,788 replies were received, with results to classification, some of the most important of which are set out in Table LXXXII.

The total additions to certain definite headings resulting from these inquiries were as follows :—To influenza, 75; to encephalitis lethargica, 72; to cerebro-spinal fever, 122; to tuberculosis of the respiratory system, 186; to other forms of tuberculosis, 117; to venereal diseases, 133; to cancer, 748; to diseases of the spinal cord, 29; to general paralysis of the insane, 16; to disseminated sclerosis, 17; to arterio-sclerosis, 40; to ulcer of stomach and duodenum, 140; to appendicitis, 63; to biliary calculi, 113; to chronic nephritis, 57; to diseases of the prostate, 55; to puerperal sepsis, 81; to congenital malformations, 70.

In addition to the foregoing, 1,821 inquiries were addressed to medical practitioners who had initialled statement " B " on the back of the new form of medical certificate, thereby indicating the possibility of their being in a position to furnish additional information respecting the certified cause of death as the result of a P.M. or laboratory examination which was not available at the time of signing the certificate. Of the 1,582 replies received to these inquiries, 810 amended the original certification.

Anæsthetics.—The usual annual statement of deaths during or connected with the administration of an anæsthetic is continued. This is obtained by secondary tabulation of these deaths, since the primary tabulation, represented by Table 21, classified all such deaths to the disease or injury on account of which the anæsthetic was administered.

The total number of deaths in Table LXXXIII, 768, is 19 more than in 1932, and is the largest number yet recorded. During the years for which fully comparable figures can be stated these deaths first increased slowly from 276 in 1911 to 366 in 1920, declined to 336 in 1922, rose to 446 and remained about that level to 1925. They then increased rapidly to 730 in 1929, and have risen further in the last two years.

For the years before 1911 the record is contained in the tables of accidental deaths, but certain causes—strangulated hernia and cancer—were at this time preferred in tabulation to the anæsthetic used. In 1933 the 768 deaths included 113 associated with cancer, and 40 with hernia. So for comparison with the years prior to 1911 the number of deaths should be reduced to 615. But during 1901–10 the deaths ranged from 133 (1901) to 234 (1910).

Table LXXXIII.—Deaths under or connected with the Administration of various Anæsthetics—1933.

Anæsthetic.		Age.													
		All Ages.	0–	1–	5–	10–	15–	20–	25–	30–	35–	40–	45–	50–	55–	65–
Chloroform	M.	52	2	4	4	3	–	2	–	2	4	3	5	4	13	6
	F.	31	–	–	2	–	2	8	2	3	4	6	–	–	3	1
Chloroform and ether	M.	91	–	5	6	4	7	9	3	1	5	6	8	5	21	11
	F.	87	1	2	7	2	3	11	8	8	10	4	13	4	7	7
Chloroform, ether and ethyl chloride	M.	2	–	–	2	–	–	–	–	–	–	–	–	–	–	–
	F.	6	–	1	3	–	–	–	–	–	–	–	–	–	–	2
Chloroform, ether and nembutal	F.	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Chloroform, ether and percaine	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Ether	M.	134	12	24	10	5	6	8	3	2	3	11	5	11	16	18
	F.	115	2	19	7	7	5	7	7	10	5	6	10	7	16	7
Ether and ethyl chloride	M.	31	2	6	8	1	3	3	1	1	–	–	2	–	3	1
	F.	26	1	4	6	1	1	–	1	2	1	–	4	1	1	3
Ether, ethyl chloride and novocaine	M.	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Ether and ethylene	M.	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Ether and avertin	F.	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Ether and nembutal	F.	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Ether and percaine	F.	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Ethyl chloride	M.	8	2	4	–	1	–	–	–	–	–	1	–	–	–	–
	F.	4	–	1	1	–	–	–	1	–	–	–	1	–	–	–
Ethyl chloride and A.C.E. mixture	M.	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–
	F.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
A.C.E mixture	M.	4	1	1	–	–	–	–	–	–	–	–	–	–	2	–
	F.	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Nitrous oxide	M.	34	–	–	1	1	2	2	2	2	2	1	2	1	9	9
	F.	24	–	2	1	–	3	2	1	1	1	–	3	3	5	2
Atropine	M.	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–
	F.	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Avertin	M.	5	–	–	–	–	–	–	–	2	1	–	–	1	–	1
	F.	4	–	–	–	–	1	1	–	–	1	–	–	–	1	–
Cocaine	M.	3	–	–	–	–	1	–	–	–	–	–	–	–	–	2
Cocaine and adrenalin	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Drenocaine	M.	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Durocaine	M.	3	–	–	–	–	–	–	–	–	–	–	1	–	1	1
	F.	2	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Evipan	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Nembutal	F.	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Neocaine	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
	F.	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Novocaine	M.	16	–	1	–	–	–	–	2	1	1	–	2	2	3	4
	F.	7	1	–	–	–	–	–	1	–	–	1	–	–	2	2
Novocaine and adrenalin	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
	F.	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Novocaine and spinocaine	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Novutox	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Percaine	M	11	–	–	–	–	–	–	–	–	–	1	1	–	3	6
	F.	12	–	–	–	–	–	–	2	–	1	–	–	1	4	4

Table LXXXIII—*continued.*

Anæsthetic.		Age.													
		All Ages.	0–	1–	5–	10–	15–	20–	25–	30–	35–	40–	45–	50–	55–	65–
Percaine and adrenalin	F.	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Planocaine	M.	4	–	–	–	–	–	–	–	–	1	–	–	1	1	1
Spinocaine	M.	3	–	–	–	–	–	–	–	–	–	–	–	–	2	1
	F.	5	–	–	–	–	–	–	–	–	–	1	–	–	2	2
Stovaine	M.	5	–	–	–	–	–	–	–	–	1	–	–	2	1	1
	F.	5	–	–	–	–	–	–	1	–	–	–	–	–	3	1
Tropococaine	M.	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
	F.	2	–	–	–	1	–	1	–	–	–	–	–	–	–	–
Kind not stated	M.	6	1	2	–	–	1	–	–	–	–	–	–	–	1	1
	F.	2	–	–	–	–	–	1	–	1	–	–	–	–	–	–
Total	M.	425	20	47	32	15	20	24	11	11	19	23	27	29	78	69
	F.	343	6	29	27	12	15	32	25	25	26	18	31	17	47	33

Subject to allowance, on the scale indicated by this reduction, for the more comprehensive nature of the figures from 1911 onwards, the records of the present century may be compared as in Table LXXXIV.

Table LXXXIV.—Deaths under or associated with Anæsthesia, 1901–33.

Year.	Males.									Females.								
	All ages	0–	5–	15–	25–	35–	45–	55–	65–	All ages	0–	5–	15–	25–	35–	45–	55–	65–
Yearly average:																		
1901–05* ..	95	14	20	9	13	16	11	7	4	53	6	9	7	11	8	8	3	2
1906–10* ..	125	26	20	12	16	18	16	9	8	77	7	14	9	18	11	10	4	3
1911–15 ..	167	30	23	14	20	28	24	16	10	116	14	17	15	16	22	18	10	5
1916–20 ..	188	36	25	25	27	22	20	19	13	119	11	16	14	21	22	17	7	9
1921–25 ..	229	40	28	20	18	27	36	37	24	169	20	17	17	30	29	25	17	12
1926–30 ..	361	56	47	30	26	37	50	62	53	288	29	29	29	44	51	49	34	23
1921	204	30	29	16	16	19	34	30	30	133	16	23	16	24	21	19	11	3
1922	185	29	21	16	9	27	30	35	18	151	16	15	12	29	31	26	12	10
1923	262	45	37	29	17	38	35	34	27	184	22	23	14	23	32	32	23	15
1924	245	51	30	21	25	21	42	39	16	184	26	11	30	29	31	21	18	18
1925	249	43	25	17	23	28	39	45	29	193	22	14	15	43	32	29	23	15
1926	306	57	43	23	29	34	39	43	38	250	32	22	29	35	44	51	23	1
1927	328	43	51	25	20	30	42	70	47	268	24	28	29	46	47	40	35	19
1928	384	63	41	30	23	43	55	67	62	272	29	21	27	44	45	44	33	29
1929	414	66	61	31	25	43	63	64	61	316	35	35	27	52	52	50	43	22
1930	375	51	41	39	34	34	52	68	56	332	27	39	33	45	66	58	35	29
1931	413	60	51	44	36	41	51	73	57	310	27	40	23	60	55	43	38	24
1932	416	66	49	37	29	45	58	68	64	333	24	40	33	60	58	42	36	40
1933	425	67	47	44	22	42	56	78	69	343	35	39	47	50	44	48	47	33

* Excluding deaths from cancer and strangulated hernia—*see* page 129.

Deaths in later periods compared with those of 1911–15 taken as 100.

Yearly average:																		
1911–15 ..	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1916–20 ..	113	120	109	179	135	79	83	119	130	103	79	94	93	131	100	94	70	180
1921–25 ..	137	133	122	143	90	96	150	231	240	146	143	100	113	188	132	139	170	240
1926–30 ..	216	187	204	214	130	132	208	388	530	248	207	171	193	275	232	272	340	460
1931	247	200	222	314	180	146	213	456	570	267	193	235	153	375	250	239	380	480
1932	249	220	213	264	145	161	242	425	640	287	171	235	220	375	264	233	360	800
1933	254	223	204	314	110	150	233	488	690	296	250	229	313	313	200	267	470	660

The increase since 1911–15 is very general in its application to sex and age, but is relatively greater at ages over 55, and least for males aged 25–45.

Prior to 1921 deaths of males were in excess of those of females

Table LXXXV.—Deaths under or associated with the Administration of Various Anæsthetics in each year, 1922 to 1933.

	Sex.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932	1933.
Anæsthetics of the Methane series:—													
Chloroform (alone) ..	M.	36	54	56	43	54	48	75	63	51	58	52	52
	F.	27	33	32	40	47	53	36	41	37	37	36	31
Ether (alone)	M.	39	73	60	61	105	101	118	142	126	134	130	134
	F.	31	50	52	52	67	72	108	121	130	114	118	115
Chloroform and Ether	M.	48	73	90	91	89	100	120	116	115	126	103	91
	F.	34	53	61	57	78	69	80	93	87	79	68	87
A.C.E. mixture ..	M.	3	10	9	11	9	9	5	3	1	10	3	4
	F.	6	6	2	3	8	2	—	6	3	—	5	1
Ether and Ethyl chloride	M.	—	1	1	7	10	15	9	12	16	28	24	31
	F.	1	—	1	3	7	17	7	13	16	10	19	26
Other mixtures, including chloroform or ether.*	M.	1	5	3	5	4	4	6	8	5	2	8	6
	F.	1	5	5	2	7	7	3	4	5	8	11	11
Ethanesal	M.	1	1	—	1	—	—	—	—	—	—	—	—
	F.	5	—	—	—	—	—	—	—	—	—	—	—
Ethyl chloride (alone)	M.	1	3	1	5	4	8	6	7	6	3	7	8
	F.	1	3	1	6	3	6	3	3	4	11	7	4
Barbituric Acid group—Nembutal, Evipan	M.	—	—	—	—	—	—	—	—	—	—	—	1
	F.	—	—	—	—	—	—	—	—	—	3	—	1
Avertin (alone) ..	M.	—	—	—	—	—	—	—	1	1	2	5	5
	F.	—	—	—	—	—	—	—	1	1	3	4	4
Avertin with cocaine derivative.	M.	—	—	—	—	—	—	—	—	—	—	—	—
	F.	—	—	—	—	—	—	—	—	—	1	2	—
Nitrous oxide	M.	6	8	9	5	9	13	18	27	23	21	36	34
	F.	1	6	4	4	6	19	12	11	18	22	27	24
Opium or Morphine and their preparations with atropine, hyoscine or cocaine derivative.	M.	—	—	—	1	—	1	—	—	1	—	1	—
	F.	—	1	—	—	—	—	—	—	1	1	1	—
Cocaine and its preparations and substitutes (without any of above):—													
Stovaine	M.	5	6	2	2	3	4	2	3	4	2	6	5
	F.	6	—	1	5	6	5	3	6	3	2	6	5
Novocaine	M.	3	—	2	2	2	5	9	12	10	6	20	18
	F.	3	1	1	2	1	3	6	3	11	4	9	8
Percaine	M.	—	—	—	—	—	—	—	—	1	7	10	11
	F.	—	—	—	—	—	—	—	1	2	6	13	13
Others	M.	—	—	—	—	2	4	2	7	3	7	8	18
	F.	1	—	2	1	3	1	4	4	2	4	5	10
Miscellaneous or unspecified, including combinations of, or containing the above, not distinguished.	M.	42	28	12	15	15	16	14	13	12	7	3	7
	F.	34	26	22	18	17	14	10	9	12	5	2	3
Total	M.	185	262	245	249	306	328	384	414	375	413	416	425
	F.	151	184	184	193	250	268	272	316	332	310	333	343

* Including combinations of chloroform or ether with morphia, atropine, nembutal or cocaine derivatives or substitutes.

at almost every age; but in each year since, except 1923, females have been in excess at 25–45 and in a few years at 15–25 and 45–55 also.

The anæsthetic agents recorded on death certificates have altered considerably in recent years, as may be seen from Table LXXXV. A further increase is recorded in 1933 in the deaths associated with ethyl chloride in combination with ether, which numbered 57. The increasing employment of cocaine derivatives is reflected in the very rapid rise in the number of deaths associated with this group of anæsthetics, from 38 in 1931 to 86 in 1933.

It need scarcely be pointed out that these fatalities depend upon the extent to which the various agents are used as well as upon the risk attaching to them. But unfortunately the deaths associated with each type of anæsthetic cannot be collated with the number of its administrations. It is not even possible to say whether, or to what extent, the rapid increase in the number of these deaths implies increased mortality under anæsthetics. The number of administrations is known to be increasing very rapidly, but cannot be estimated. The deaths tabulated, moreover, can only be those under, not those caused by, anæsthesia. It is impossible from certification to distinguish between deaths from operation under anæsthesia and deaths due to the anæsthetic itself.

Of the 768 deaths in 1933 shown in Table LXXXIV, 618 (80 per cent.) were classed to the 22 headings enumerated in Table LXXXVI, the remainder being of very varied causation. The composition of this list changes little from year to year.

Table LXXXVI.—Classification of Deaths under or associated with Anæsthesia, 1933.

	Cause to which Death was assigned.	Males.	Females.		Cause to which Death was assigned.	Males	Females.
24–32	Non-respiratory tuberculosis.	9	7	122 *b*	Intestinal obstruction.	24	17
45–53	Cancer	65	48	126	Biliary calculi ..	7	9
66 *b*	Exophthalmic goitre	2	11	127 (pt.)	Diseases of the gall bladder.	3	8
89 *b*	Diseases of the mastoid sinus.	12	14	136 *a*	Stricture of the urethra.	4	—
104	Diseases of the nasal fossæ and annexa.	5	1	137	Diseases of the prostate.	14	—
110 : 1	Empyema.. ..	14	5	138 (pt.)	Circumcision ..	5	—
115 : 1 (pt.)	Extraction of teeth.	13	6	54 *a* (pt.)	Uterine fibroids ..	—	10
115 : 3	Diseases of the tonsils.	26	13	140–150	Childbirth and abortion.	—	50
117	Ulcer of the stomach or duodenum.	31	4	154	Acute infective osteomyelitis.	5	2
121	Appendicitis ..	38	27	157	Congenital malformations.	12	7
122 *a*	Hernia	30	10	163–198	Violence	30	20

The numbers of deaths reported from different classes of nstitutions, etc., in various regions of the country are stated in Table LXXXVII, in which, as place of occurrence is evidently of more interest for these deaths than place of residence, they have been tabulated by area of registration.

Table LXXXVII.—Deaths under Anæsthetics Registered in 1933. Distribution by Part of Country and Place of Occurrence.

		Greater London.	South-East excluding Greater London.	North.	Midland.	East.	South-West.	Wales.	England and Wales.
Hospitals	M.	89	44	119	34	15	11	19	331
	F.	71	31	90	21	14	13	13	253
Poor Law Institutions	M.	25	1	22	10	1	—	1	60
	F.	23	2	21	12	—	1	2	61
Mental Hospitals ..	M.	—	—	—	—	—	—	—	—
	F.	—	—	—	—	—	—	—	—
Nursing Homes ..	M.	3	1	4	2	2	1	2	15
	F.	6	2	4	—	—	—	—	12
Elsewhere	M.	2	1	4	6	3	1	2	19
	F.	1	3	7	1	3	2	—	17
Total	M.	119	47	149	52	21	13	24	425
	F.	101	38	122	34	17	16	15	343

Since most of these deaths occur in institutions to which patients are drawn from wide areas, it is not surprising to find that the ratio of anæsthetic deaths to resident population is highest in Greater London, 26 to each million, and lowest in the Midland and South-West regions, where the ratios are respectively 12 and 14 to each million.

Status Lymphaticus and Anæsthetics.—The deaths from status lymphaticus primarily classified to diseases of the thymus (67) in Table 21 reached a maximum of 202 in 1929, but then fell somewhat precipitately to 138 in 1930. In the last 3 years they have numbered 143, 154 and 153. In addition to these 153 deaths, there were, in 1933, 50 deaths under anæsthetics in the case of which record was made of the presence of this condition but which have been referred in tabulation to the condition occasioning the administration of the anæsthetic.

The sex and age distribution of these was as follows :—

	All Ages.	0–	5–	10–	15–	20–	25–	35–
Males	32	14	8	3	2	4	1	—
Females	18	7	5	1	1	1	2	1

WINTER MORTALITY FROM VARIOUS CAUSES IN 1921–33 IN RELATION TO THE MEAN AIR TEMPERATURE AND INFLUENZA RATE.

In the Supplement to the 81st Annual Report, all deaths registered during the influenza pandemic of 1918–19 with mention of influenza on the certificate were tabulated according to the associated cause, and estimates were also made of the deaths attributed to phthisis, pneumonia, bronchitis and heart disease, which, although influenza was not mentioned as a contributory cause, probably resulted from the epidemic. Thus, during the first quarter of 1919 it was estimated that 32,212 deaths assigned to influenza, 4,738 to pneumonia, 7,402 to bronchitis, 2,010 to heart disease and 821 to phthisis were really attributable to the epidemic. The importance of influenza epidemics in producing fluctuations in the annual deaths attributed to various causes has become increasingly manifest in the last decade and has been frequently pointed out in the Annual Reviews, though no attempt has been made to estimate the amount of this effect since the 1918–19 epidemic.

Since 1920 the epidemics have been virtually confined to the first quarter of the year, as may be seen from the distributions of individual months in the 13 years 1921–33 according to the annual death-rate from influenza per 10,000 in that month (Table LXXXVIII).

Table LXXXVIII.—Months of 1921–1933 distributed according to their Influenza death-rate, and months of the first quarters of these years distributed also according to their Mean Air Temperatures.

Influenza death-rate per 10,000.	December.	January.	February.	March.	April.	Other months.	Months of March quarters distributed according to their mean air temperatures.						
							33°—	35°—	37°—	39°—	41°—	43°—	45°—
0—	12	7	5	6	9	13	—	—	1	2	7	5	3
5—	1	3	—	3	4	—	—	1	—	3	1	1	—
10—	—	1	3	2	—	—	—	—	1	3	1	—	1
15—	—	—	1	1	—	—	—	—	1	1	—	—	—
20—	—	—	2	—	—	—	—	—	—	2	—	—	—
25—	—	—	—	—	—	—	—	—	—	—	—	—	—
30—	—	2	2	—	—	—	1	—	1	2	—	—	—
35—	—	—	—	1	—	—	—	—	—	—	—	1	—

Any correlation between influenza deaths and those attributed to other causes is therefore most likely to be found in the mortalities of January, February and March.

The tabulation of monthly deaths from separate causes (Table 23) since 1921 makes it possible to calculate the deaths expected from a given cause in January, February or March on the basis of the general secular trend due to changes in population, or prevalence of the disease or fashions in certification, and then to relate the fluctuations above or below the expected number to two factors not quite independent of one another, the mean air temperature of the month in England and Wales and the influenza death rate in the

month. The mean air temperatures of the three months in the 12 years 1921–32 were respectively 41·1° F., 40·0° F. and 42·4° F.; and the meteorological conditions may be regarded as sufficiently alike to allow January, February and March to be dealt with together. The tendency for coldness of these months to be attended by greater influenza mortality is indicated by the distribution of the 39 first quarters' months of the 13 years according to their mean temperatures (Table LXXXVIII).

Table LXXXIX shows the percentage ratios of actual to expected deaths attributed to various causes in groups of 4 of the 36 months of January, February and March in the 12 years 1921–32, after first arranging them in ascending order of influenza death rate, separating into the 12 months of lowest rate, 12 of intermediate and 12 of highest rate, and then arranging each set of 12 in order of decreasing mean air temperature in England and Wales. The expected deaths from a given cause in each month have been calculated by drawing a straight line through the mean annual deaths in 1921–26 and in 1927–32, and assuming that the average rate of annual decrement due to progressive secular changes, as given by the slope of this line, was the same for each individual month as for the whole year. The total January deaths in 1921–32 were then distributed over the 12 Januaries on this assumption, and so for the February and March deaths. The deaths which actually occurred in a group of 4 months are then expressed as a percentage of the sum of the calculated deaths in those months.

The mean influenza death rates in each group of months are given at the head of the table and the mean air temperatures in England and Wales at the foot. In the 12 months of lowest influenza the rate ranged from 184 to 346 per million, in the 12 moderate months from 352 to 1,007, and in the 12 epidemic months of highest influenza from 1,012 to 3,519. The mean air temperatures of the 3 groups of 12 were 42·5°, 41·1° and 39·9°, respectively, indicating the tendency for influenza mortality to be greater when the temperature is lower. In Diagram 7 the effect of this correlation between the two variables, which must be borne in mind when using Table LXXXIX, is almost eliminated by plotting the curves on a scale of temperature, so that the effect of the presence of influenza under given temperature conditions is represented by the amount of vertical separation of the graphs at that temperature, and the effect of increasing cold between certain limits of influenza mortality can be inferred from the amount of upward or downward slope of the graphs. As a rough measure of the relative importance of the two factors in their association with the deaths attributed to a specific cause, one may compare the average vertical distance between the overlapping portions of the graphs for high and low influenza with the difference between the vertical heights of the extremities of the graph for low influenza. It is not safe to draw conclusions from the slope of the graph for high influenza.

DIAGRAM 7. ASSOCIATION WITH INFLUENZA AND MEAN AIR TEMPERATURE OF MORTALITY FROM VARIOUS CAUSES IN THE FIRST THREE MONTHS OF THE YEARS 1921-1932.

12 Months with lowest Influenza ___ 12 Months with moderate Influenza ____ 12 Months with highest Influenza .....

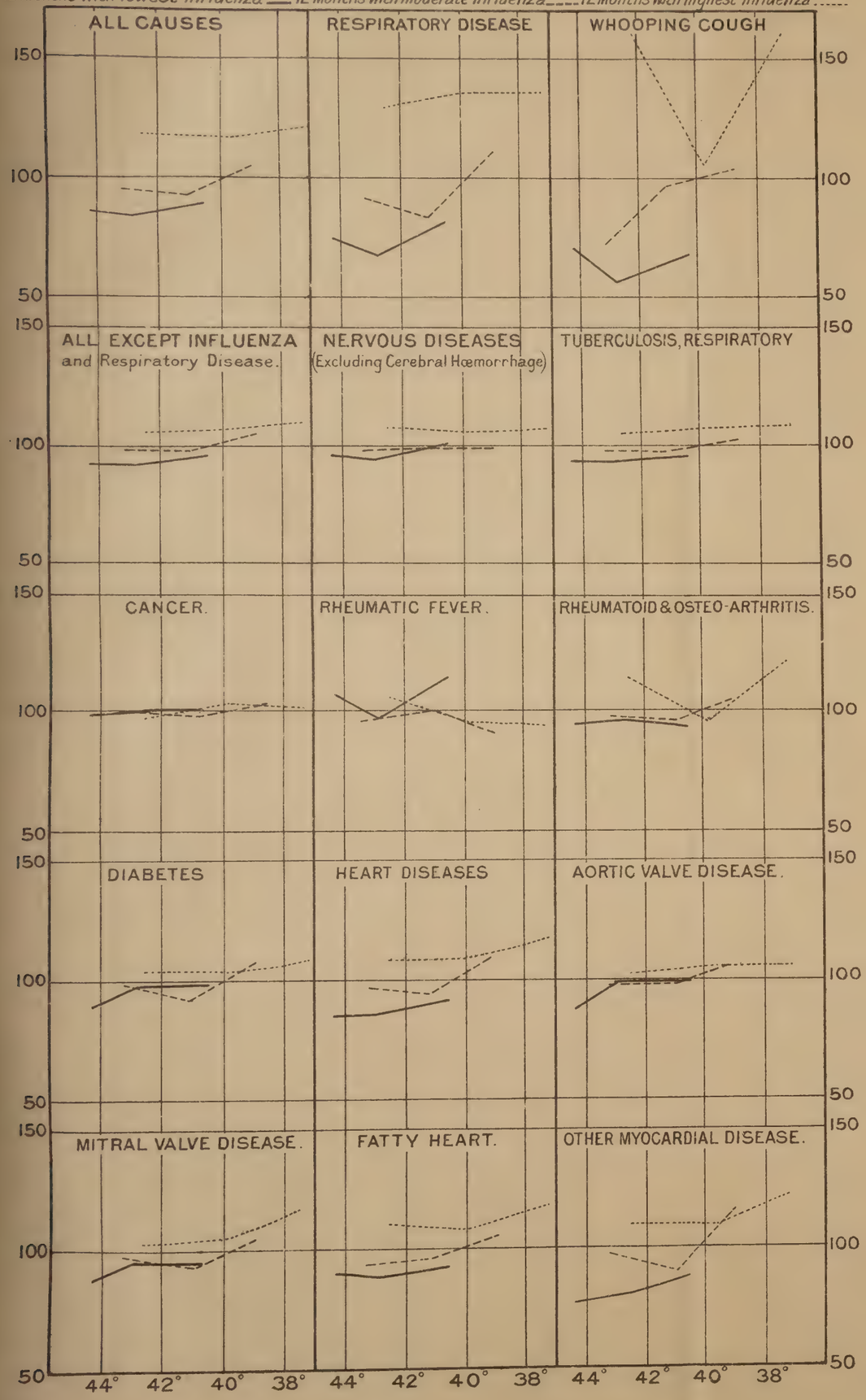

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DIAGRAM 7 (Continued)

——— 12 Months with lowest Influenza. ---- 12 Months with moderate Influenza. ..... 12 Months with highest Influenza.

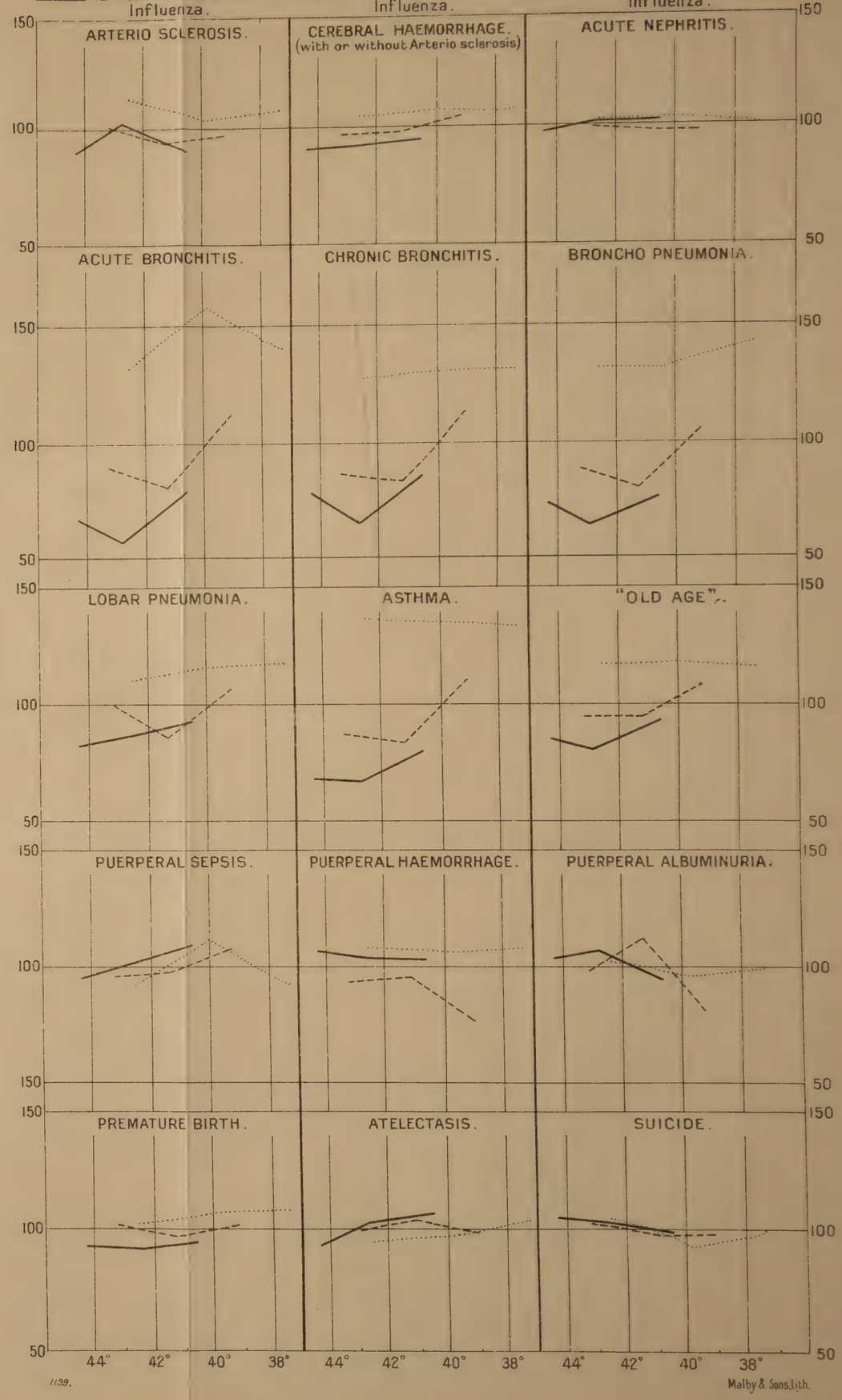

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Table LXXXIX.—Mortality from Various Causes, per cent. of that expected from the secular trend, in 1921–32, when the 36 months of the 1st quarters are arranged in order of Mean Air Temperature and Influenza Mortality : also in January, February, March, 1933 separately.

List No. (1931).	Cause of Death.	1933. Death rate per cent. of rate in 1928–32.			1921–32. Actual deaths per 100 expected.								
					12 months with lowest Influenza.			12 months with moderate Influenza.			12 months with highest Influenza.		
		Jan.	Feb.	Mar.	4 Warm.	4 Medium.	4 Cold.	4 Warm.	4 Medium.	4 Cold.	4 Warm.	4 Medium.	4 Cold.
	INFLUENZA (Mean rate per Million).	*3,356*	*2,305*	*354*	*290*	*260*	*246*	*571*	*720*	*594*	*2,032*	*1,877*	*2,212*
	ALL CAUSES	138	105	78	85	83	89	95	93	103	117	115	120
	RESPIRATORY DISEASES	141	86	52	74	67	81	91	83	109	129	135	135
	All except Influenza and Respiratory Diseases.	115	102	90	92	92	96	98	97	104	105	106	109
	NERVOUS DISEASES except cerebral hæmorrhage.	94	94	78	95	93	100	97	98	99	107	105	106
9	Whooping Cough ..	128	78	44	70	55	67	72	96	103	169	106	161
16	Acute Poliomyelitis ..	152	174	85	100	76	79	111	116	98	116	88	126
18	Cerebro spinal fever..	183	160	111	94	68	70	112	109	111	90	145	91
23	Tuberculosis, respiratory.	117	101	84	92	92	95	98	98	102	105	107	111
24	Tuberculosis, Nervous System.	82	89	97	104	98	99	99	100	101	98	103	96
25	Tuberculosis, Intestinal	83	75	81	102	99	102	105	93	98	96	108	98
36	Septicæmia	109	85	75	114	108	120	86	97	79	111	98	89
45–55	Cancer	109	102	103	99	100	100	100	99	101	98	102	101
56	Rheumatic Fever ..	97	87	84	106	97	115	96	100	92	106	95	94
57(2)	Rheumatoid and Osteo-arthritis.	107	102	84	92	94	91	97	95	104	114	95	118
59	Diabetes	121	108	101	89	97	98	99	92	106	104	104	108
83	General Paralysis of Insane.	98	98	78	88	98	97	96	93	104	109	117	103
85	Epilepsy	98	104	84	93	92	96	100	102	105	98	107	105
	HEART DISEASES ..	144	117	96	84	85	91	96	94	109	108	109	117
92(1)	Aortic Valve Disease	110	97	84	87	99	100	98	98	105	102	105	105
92(2)	Mitral ,, ,,	114	90	82	88	95	95	98	94	104	103	105	116
93*b*1	Fatty heart	96	80	75	90	89	93	94	96	103	110	107	116
93*b*2, 3 93*c*	Other Myocardial disease.	169	136	105	77	80	88	97	91	111	109	109	120
97	Arterio sclerosis ..	111	99	84	90	102	90	101	95	97	113	104	107
82,97(1)	Cerebral hæmorrhage with or without arteriosclerosis.	111	107	90	91	92	96	97	97	105	105	108	108
106(*a*)	Acute Bronchitis ..	177	92	44	66	57	78	89	81	112	132	158	140
106(*b*)	Chronic Bronchitis ..	143	88	55	78	66	87	87	84	113	128	134	135
107	Broncho-pneumonia..	155	87	54	72	64	75	87	78	106	137	137	142
108	Lobar pneumonia ..	116	83	60	82	86	92	100	86	107	110	116	118
109	Pneumonia undefined	115	73	55	76	70	84	98	84	110	119	139	133
112	Asthma	154	80	46	67	66	80	87	84	110	136	135	133
117	Gastric and duodenal ulcer.	103	89	88	97	98	104	96	96	102	100	107	96
121	Appendicitis	114	106	105	99	99	100	104	98	101	100	99	99
118(1)	Gastritis	68	77	73	101	101	90	101	99	100	93	114	103
130	Acute Nephritis ..	83	81	96	98	101	102	100	98	97	102	102	101
131	Chronic Nephritis ..	101	85	88	91	98	102	99	100	104	101	98	105
135(*a*)	Cystitis	74	95	62	89	92	93	104	104	94	109	113	102
140, 145	Puerperal sepsis ..	78	77	78	95	100	109	95	97	108	91	111	93
144	,, hæmorrhage	104	112	76	106	104	103	93	95	78	108	107	109
146	,, albuminuria	66	79	62	104	107	95	99	113	82	103	97	99
159	Premature birth ..	113	92	84	93	92	95	101	98	102	102	108	110
161(*a*)	Atelectasis	130	75	104	93	102	107	99	104	99	95	97	104
162	Old Age	113	101	72	85	80	93	95	95	108	117	117	116
163–171	Suicide	113	113	116	105	103	98	103	97	97	106	92	98
	Mean Air Temperature (England and Wales)	37·5	40·1	45·4	44·3	42·8	40·5	43·2	41·1	39·1	42·5	39·8	37·3

A simple measure of the amount of increase in the mortality attributed to various causes during influenza epidemics, based upon comparison of months of the same average temperature, is obtained by calculating the vertical distance between the uppermost and lowest graphs at 41·5° F., the mid-point on the temperature scale of the overlapping portion of these graphs, and expressing it as a percentage of the height of the lower graph at that temperature. This indicates the percentage increase in mortality which accompanied a known moderate degree of epidemic influenza when freed from the effects of temperature, and has been calculated for certain causes in Table XC. When multiplied by the deaths per month which occurred during the 8 coldest months of low influenza rate, comparative figures are obtained in the second column representing the monthly excess of deaths attributed to each group of causes which was associated with the monthly excess of influenza deaths at the head of the column, and in parentheses these have been expressed in terms of 100 influenza deaths.

Table XC.—Increase in Monthly Mortality associated with Epidemic Influenza, comparing months of similar temperature in the March quarters of 1921–32.

	Increase per cent. (from graphs at 41·5° F.).	Estimated excess of deaths per month.	
Influenza	656	5,360	(100)
Whooping-cough	136	431	(8)
Tuberculosis, respiratory ..	13	361	(7)
Diseases of Respiratory System	74	5,408	(101)
Heart diseases	22	1,558	(29)
Old age	34	701	(13)
Other causes	—	1,070	(20)
All causes except Influenza ..	22	9,529	(178)

Table LXXXIX also gives the death-rates in January, 1933, from the various causes, expressed as percentages of the mean rate in the previous 5 Januaries, and similarly for February and March. Compared with the previous 12 years, January, 1933 was remarkable in having the highest influenza death-rate of any January and the lowest mean air temperature save in January, 1929. February had the highest influenza rate of any February except 1927 and 1929, its mean air temperature being average, whilst March had a low influenza rate and the highest mean air temperature of any March in the period.

Whooping-cough.—Mortality attributed to this cause in the first quarter of the year was more profoundly associated with the

presence of influenza than that attributed to any of the causes in Diagram 7 except perhaps acute bronchitis and broncho-pneumonia. Temperature seems to have no consistent relation with mortality in months of low or moderate influenza level. After allowing for the possible effects of coldness (Table XC), whooping-cough mortality was more than doubled, the average excess amounting to over 400 deaths per month, or about 8 to each 100 additional influenza deaths. It is, therefore, a matter of some importance to ascertain the reason for this.

In the absence of national notification statistics of whooping-cough it remains uncertain whether it is the prevalence or the fatality of whooping-cough which tends to move in sympathy with influenza mortality. In the former event it would be necessary to postulate some common factor, but in the latter event the explanation might lie in superimposed catarrhal infections transmitted from persons with influenza or its secondary infections to children with whooping-cough.

Deaths attributed to whooping-cough stated jointly with influenza are assigned to the former, but during the epidemic of January and February, 1933, influenza was mentioned on only 22 out of 801 certificates of deaths classed to whooping-cough. Only a small fraction of the whooping-cough deaths in excess of expectation during influenza epidemics have any mention of influenza as a complication, and if the explanation lies in a superimposed infection which is specially fatal, it is evident that the double infection is not usually recognised as such.

Respiratory diseases.—Deaths attributed to respiratory disease with mention of influenza are of course assigned to the latter, and the respiratory deaths in Table LXXXIX and Diagram 7 are those without mention of influenza as an associated cause. When months of low or moderate influenza mortality are compared, it is evident from the graphs that a low mean air temperature tends to be accompanied by a rise in mortality, but that this is not so important as the association with influenza in months of similar temperature. The temperature effect is more pronounced for bronchitis and broncho-pneumonia than for lobar pneumonia, and the graphs suggest an optimum mean temperature for the bronchial affections in the March quarter round about 42° F., high or low average monthly temperatures having been alike more conducive to mortality in the period under review.

The association with influenza is greatest for acute bronchitis, deaths so attributed being more than doubled during influenza epidemics in winter months of average temperature. For broncho-pneumonia and chronic bronchitis the association is almost as great, but for lobar pneumonia the enhancement of mortality during epidemics has been only of the order of 20 per cent. Asthma shows a degree of association both with temperature and influenza similar to that of broncho-pneumonia. After allowing for the effect

of low temperatures in enhancing mortality from both influenza and respiratory disease, Table XC shows that the latter increased by 74 per cent. during epidemics, the excess of deaths attributed to respiratory diseases without mention of influenza being approximately equal to the excess of deaths attributed to influenza (with of without respiratory complications).

Heart Disease.—Mortality manifests a slight increase with falling temperature in the influenza-free months, this being most apparent for aortic disease and for myocardial disease other than fatty. The bulk of the mortality from other myocardial disease is, of course, that of old people. After allowing for coldness as a common factor in enhancing mortality, it appears (Table XC) that influenza epidemics have been accompanied by an increase of about 22 per cent. in mortality attributed to heart diseases, and that this is equivalent to an excess of more than 1,500 deaths per month. The separation between the graphs in Diagram 7 at 41·5° indicates that deaths from aortic disease were increased by about 5 per cent., mitral disease by about 10 per cent., fatty heart by about 18 per cent. and other myocardial disease by about 22 per cent. during the months with high influenza mortality. It must be remembered that deaths attributed to bronchitis with associated myocardial disease, a description now very frequently used on death certificates, are assigned by the operation of rules of precedence to the heart disease, and it would probably be found that most of the increase in myocardial disease recorded during influenza epidemics consists of such deaths.

Deaths assigned to "old age" without mention of influenza were increased by 34 per cent., corresponding to an excess of 700 deaths per month during epidemics, and this and the high rates of increase for "myocardial disease" and for "rheumatoid and osteo-arthritis" suggest that a great deal of extra mortality results amongst old people during epidemics of influenza for which the latter is not recognised as a causative factor, or at least not mentioned on the death certificate as such.

Arterio-sclerosis shows no consistent relation with temperature, but cerebral hæmorrhage deaths increased slightly with coldness. Mortality from each of these causes was enhanced during severe influenza epidemics.

Death-rates from *phthisis* increase slightly with greater coldness, but are more sensitive to the presence of influenza, an average excess of 361 deaths per month occurring during epidemics (Table XC), or about 7 to each 100 influenza deaths. Examination of the mortality in months subsequent to epidemics shows, however, a compensatory fall, and the excess represents in the main an acceleration of the fatal issue in tuberculous patients, with resulting concentration of the year's deaths into the first quarter, rather than an addition to the year's mortality from this cause.

Of other causes, cancer, rheumatic fever and acute nephritis show a conspicuous absence of any effect, either of influenza or of air temperature (Diagram 7), upon the mortality assigned to them, and no consistent relation with either factor is shown by puerperal sepsis, hæmorrhage or albuminuria. Deaths from premature birth are only slightly influenced by temperature, but are considerably increased in numbers during influenza epidemics, whereas atelectasis deaths increase with coldness but are less frequent during influenza epidemics. Suicides were more frequent when the winter months were warm than when they were unusually cold, and no relation with influenza is apparent.

Table XC shows that, after allowance for the association with temperature, mortality from all causes other than influenza increased by 22 per cent. during influenza epidemics, the excess amounting to 178 deaths to every 100 additional influenza deaths.

Validity of Certification.

Table XCI shows, for every division of the International List of causes having 5 or more deaths, and for some of its subdivisions (each with 5 or more deaths), the extent to which the diagnosis had been confirmed by an autopsy, by a pathological or bacteriological examination after death without autopsy, or by other means such as an operation recorded on the death certificate. This table for 1933 may be compared with Table LXIX in the Review for 1928, bearing in mind the changes caused by revision of the International List in 1931. The tables do not include deaths certified after an inquest unaccompanied by an autopsy (such deaths being of course mainly from violent causes).

The form of medical certificate in use since 1927 requires statement for each death as to whether a *post mortem* examination has been made or not, and it also includes a blank form of notice by the

TABLE XCI.—Deaths from Causes confirmed by a pathological or bacteriological Post Mortem Examination or by operation mentioned on the Death Certificate per 1,000 Deaths ascribed to each Cause.—1933.

International List No.	Causes of Death.	Males.	Females.	Persons.
	ALL CAUSES	134	100	117
1–44	**I.—Infectious and Parasitic Diseases.**	**84**	**63**	**74**
1 & 2	Typhoid and paratyphoid fevers.	226	255	239
1	Typhoid fever	181	295	230
2	Paratyphoid fevers ...	474	100	282
5	Undulant fever	—	—	—
7	Measles	31	14	23
8	Scarlet fever	74	69	71
9	Whooping cough... ...	34	25	29
10	Diptheria	45	63	54
11	Influenza	37	34	35
13	Dysentery	518	472	500
	(*a*) Amœbic	400	—	333
	(*b*) Bacillary	586	333	500
	(*c*) Other or unspecified	455	600	524
15	Erysipelas	99	49	76
16	Acute poliomyelitis ...	185	253	213
17	Encephalitis lethargica ...	100	83	92
18	Cerebro-spinal fever ...	206	240	221
22	Tetanus	263	214	250

Table XCI—*continued.*

International List No.	Causes of Death.	Males.	Females.	Persons.
23–32	Tuberculosis (all forms)	93	73	84
23	Respiratory system ...	74	48	63
24	Central nervous system	148	156	152
25	Intestines and peritoneum.	227	205	215
26	Vertebral column ...	122	76	104
27	Other bones and joints	127	84	110
28	Skin and subcutaneous tissues.	154	—	43
29	Lymphatic system (abdominal and bronchial glands excepted).	268	250	262
30	Genito-urinary system	244	284	258
31	Other organs	591	600	594
	(1) Adrenals	833	500	722
	(2) Other sites included under 31.	300	750	429
32	Disseminated tuberculosis.	269	291	279
34	Syphilis	286	226	266
	(*a*) Congenital syphilis	191	157	176
	(*b* & *c*) Acquired or unspecified.	308	256	292
35	Other venereal diseases ...	136	214	155
36	Purulent infection, septicæmia.	366	289	336
	(*a*) Septicæmia ...	370	263	329
	(*b*) Pyæmia	348	516	416
38	Malaria	222	250	227
41	Hydatid cysts	467	625	522
42	Other diseases due to helminths.	—	—	—
43	Mycoses	302	150	243
44	Other infectious or parasitic diseases.	250	182	222
45–55	**II.—Cancer and Other Tumours.**	**170**	**152**	**160**
45–53	Cancer, Malignant disease	164	138	150
45	Buccal cavity and pharynx.	94	73	90
46	Digestive organs and peritoneum.	156	117	138
47	Respiratory organs ...	234	173	219
48	Uterus	—	106	—
49	Other female genital organs.	—	165	—
50	Breast	182	183	183
51	Male genito-urinary organs.	175	—	—
52	Skin	91	72	82
53	Other or unspecified organs.	266	215	236
54	Non-malignant tumours	583	570	574
	(*a*) Female genital organs	—	557	—
	(*b*) Other sites	583	596	589
55	Tumours of undetermined nature.	154	137	146
	(*a*) Female genital organs.	—	45	—
	(*b*) Other sites	154	140	148
56–69	**III.—Rheumatism, Diseases of Nutrition and of Endocrine glands and other General Diseases.**	**91**	**72**	**79**
56	Rheumatic fever ...	112	110	111
57	Chronic rheumatism, Osteo-arthritis.	16	11	13
58	Gout	20	22	20
59	Diabetes	59	46	51
60	Scurvy	167	200	188
62	Pellagra	—	200	143
63	Rickets	123	143	132
64	Osteomalacia	—	—	—
65	Diseases of the pituitary gland.	280	42	163
66	Diseases of the thyroid and parathyroid glands.	206	154	161
	(*a*) Simple goitre ...	355	216	237
	(*b*) Exophthalmic goitre	214	158	165
	(*c*) Myxœdema, Cretinism.	27	56	51
67	Diseases of the thymus ...	930	887	915
68	Diseases of the adrenals	330	234	271
69	Other general diseases ...	324	235	267
70–74	**IV.—Diseases of the Blood and Blood-forming Organs.**	**172**	**129**	**148**
70	Hæmorrhagic conditions	233	214	223
	(*a*) Purpura	248	220	232
	(*b*) Hæmophilia ...	206	196	202
71	Anæmia, Chlorosis ...	96	80	86
	(*a*) Pernicious anæmia...	80	67	72
	(*b*) Other anæmias and chlorosis.	232	188	205
72	Leukæmia, Aleukæmia ...	248	213	233
	(*a*) Leukæmia	297	249	274
	(*b*) Aleukæmia (Lymphadenoma).	189	141	172
73	Diseases of the spleen ...	304	317	310
74	Other diseases of the blood and blood-forming organs.	391	353	375
75–77	**V.—Chronic Poisoning ...**	**316**	**351**	**327**
75	Alcoholism (acute or chronic).	209	300	247
76	Chronic poisoning by other organic substances.	333	—	167
77	Chronic poisoning by mineral substances.	467	1,000	529
78–79	**VI.—Diseases of the Nervous System and Sense Organs.***	**108**	**74**	**90**
78	Encephalitis	538	488	516
79	Meningitis	226	200	216
80	Tabes dorsalis (Locomotor ataxy).	51	78	56
81	Other diseases of the spinal cord.	66	64	65
	(1) Progressive muscular atrophy.	49	53	51
	(2) Subacute combined sclerosis.	47	89	71
82	Cerebral hæmorrhage, Apoplexy, etc.	46	34	39
	(*a*) Cerebral hæmorrhage	53	37	44
	(*b*) Cerebral embolism and thrombosis.	32	28	30
	(1) Cerebral embolism	34	10	20
	(2) Cerebral thrombosis	26	21	23
	(3) Cerebral softening	162	179	172
	(*c*) Hemiplegia and other paralyses of unstated origin.	4	5	4
	(1) Hemiplegia ...	2	5	4
	(2) Other paralyses of unstated origin.	23	—	10
83	General paralysis of the insane.	463	510	474
84	Other forms of insanity...	276	291	285
85	Epilepsy	215	158	188
86	Infantile convulsions (under 5 years of age).	41	82	58
87	Other diseases of the nervous system.	44	37	40
	(*d*) Disseminated sclerosis.	28	31	29
88	Diseases of the eye and annexa.	467	426	446
89	Diseases of the ear and mastoid sinus.	453	359	412

Table XCI—*continued.*

International List No.	Causes of Death.	Males.	Females.	Persons.
90–103	**VII.—Diseases of the Circulatory System.**	**103**	**63**	**83**
90–95	Heart diseases	107	62	83
90	Pericarditis	556	522	543
91	Acute endocarditis ...	251	198	224
92	Chronic endocarditis, Valvular disease.	107	65	83
	(1) Aortic valve disease	208	172	195
	(2) Mitral valve disease	72	57	62
	(3) Aortic and mitral valve disease.	145	130	138
	(4) Endocarditis, not returned as acute or chronic.	70	26	44
	(5) Other or unspecified valve disease.	85	51	66
93	Diseases of the myocardium.	67	48	57
	(*a*) Acute myocarditis ...	22	56	39
	(*b*) Myocardial degeneration.	79	57	67
	(1) Fatty heart ...	515	334	414
	(2) Cardiovascular degeneration.	73	69	71
	(3) Other diseases included under 93 (*b*).	51	33	41
	(*c*) Myocarditis, not distinguished as acute or chronic.	23	13	18
94	Diseases of the coronary arteries, Angina pectoris.	298	223	274
95	Other diseases of the heart	48	24	34
	(*a*) Disordered action of heart.	23	18	20
	(*b*) Other diseases included under 95.	59	28	42
	(1) Dilatation of heart (cause unspecified).	173	92	135
	(2) Heart disease (undefined).	52	25	37
96	Aneurysm	488	626	530
97	Arterio-sclerosis	53	43	48
	(1) With cerebral hæmorrhage.	55	45	50
	(2) With record of other cerebral vascular lesion.	32	21	27
	(3) Without record of cerebral vascular lesion.	59	53	56
98	Gangrene	38	47	42
99	Other diseases of the arteries.	266	230	247
100	Diseases of the veins (Varix, hæmorrhoids, phlebitis, etc.).	142	125	130
101	Diseases of the lymphatic system (lymphangitis, etc.).	289	224	253
102	Abnormalities of blood pressure.	156	78	120
103	Other diseases of the circulatory system.	333	571	500
104–114	**VIII.—Diseases of the Respiratory System.**	**98**	**71**	**86**
104	Diseases of the nasal fossæ and annexa.	500	471	487
105	Diseases of the larynx ...	168	155	162
106	Bronchitis	31	19	25
107–109	Pneumonia (all forms) ...	124	106	117
107	Broncho-pneumonia ...	109	96	103
108	Lobar pneumonia ...	153	143	149
109	Pneumonia (not otherwise defined).	110	67	92
110	Pleurisy	260	223	246
	(1) Empyema	354	350	353
	(2) Other pleurisy ...	161	142	152
111	Congestion and hæmorrhagic infarct of lung, etc.	147	81	109
112	Asthma	14	23	18
113	Pulmonary emphysema...	255	167	237
114	Other diseases of the respiratory system.	454	264	415
	(*a*) Chronic interstitial pneumonia, including occupational diseases of the lung.	472	189	423
115–129	**IX.—Diseases of the Digestive System.**	**326**	**292**	**310**
115	Diseases of the buccal cavity, pharynx, etc.	240	171	203
116	Diseases of the œsophagus	519	467	500
117	Ulcer of the stomach or duodenum.	458	355	433
	(*a*) Ulcer of the stomach	434	338	407
	(*b*) Ulcer of the duodenum.	500	430	490
118	Other diseases of the stomach.	126	63	93
119 & 120	Diarrhœa and enteritis ...	118	139	128
121	Appendicitis	445	469	456
122	Hernia, Intestinal obstruction.	421	358	391
	(*a*) Hernia	458	385	421
	(1) Strangulated hernia	440	392	414
	(2) Hernia not returned as strangulated.	503	361	438
	(*b*) Intestinal obstruction	395	335	367
123	Other diseases of the intestines.	384	281	334
	(1) Constipation, Intestinal stasis.	195	109	143
	(2) Diverticulitis ...	476	350	416
	(3) Other diseases included under 123.	275	263	269
124	Cirrhosis of the liver ...	148	248	182
	(*a*) Returned as alcoholic	183	351	250
	(*b*) Not returned as alcoholic.	142	225	170
125	Other diseases of the liver	391	298	338
	(1) Acute yellow atrophy	409	426	421
	(2) Other diseases included under 125.	385	183	288
126	Biliary calculi	455	454	454
	(1) With cholecystitis ...	389	393	392
	(2) Without mention of cholecystitis.	485	488	488
127	Other diseases of the gall bladder and ducts.	347	254	282
128	Diseases of the pancreas	440	457	449
129	Peritonitis, without stated cause.	453	399	416
130–139	**X.—Non-venereal Diseases of the Genito-urinary System and annexa.**	**173**	**144**	**162**
130–132	Nephritis	108	108	108
130	Acute nephritis ...	140	100	120
131	Chronic nephritis ...	112	118	115
132	Nephritis not stated to be acute or chronic.	52	39	45
133	Other diseases of the kidney and annexa.	364	292	323
	(*a*) Pyelitis	276	250	261
134	Calculi of the urinary passages.	366	382	372
	(*a*) Calculi of kidney and ureter.	340	371	353
	(*b*) Calculi of the bladder	430	545	444
135	Diseases of the bladder ...	132	176	150
	(*a*) Cystitis	101	160	125
	(*b*) Other diseases of the bladder.	417	409	414

Table XCI—*continued.*

International List No.	Causes of Death.	Males.	Females.	Persons.
136	Diseases of the urethra, urinary abscess, etc.	195	—	193
137	Diseases of the prostate...	255	—	—
138	Diseases of the male genital organs.	429	—	—
139	Diseases of the female genital organs	—	475	—
	(*a*) Diseases of the ovary, Fallopian tube and parametrium.	—	463	—
	(*b*) Diseases of the uterus	—	495	—
140–150	**XI.—Diseases of Pregnancy, Childbirth, and the Puerperal State.**	—	**265**	—
140 & 145	Puerperal sepsis	—	321	—
140	Post-abortive sepsis ...	—	525	—
141	Abortion not returned as septic.	—	306	—
142	Ectopic gestation ...	—	467	—
143	Other accidents of pregnancy.	—	182	—
144	Puerperal hæmorrhage ...	—	141	—
	(*a*) Placenta prævia ...	—	139	—
	(*b*) Other puerperal hæmorrhage.	—	144	—
145	Puerperal sepsis not returned as post-abortive.	—	256	—
146	Puerperal albuminuria and convulsions.	—	180	—
147	Other toxæmias of pregnancy.	—	371	—
148	Puerperal phlegmasia alba dolens, embolism and sudden death.	—	149	—
149	Other accidents of childbirth.	—	254	—
150	Other or unspecified conditions of the puerperal state.	—	158	—
151–153	**XII.—Diseases of the Skin and Cellular Tissue.**	**176**	**121**	**151**
151	Carbuncle, Boil	157	165	160
152	Cellulitis, Acute abscess...	242	139	197
153	Other diseases of the skin and its annexa.	102	72	85
154–156	**XIII.—Diseases of the Bones and Organs of Locomotion.**	**281**	**240**	**264**
154	Acute infective osteomyelitis and periostitis.	348	303	330
155	Other diseases of the bones	174	132	157
156	Diseases of the joints and other organs of locomotion.	236	213	226
157	**XIV.—Congenital Malformations.**	**235**	**173**	**207**
158–161	**XV.—Diseases of Early Infancy.**	**71**	**66**	**69**
158	Congenital debility ...	68	66	67
159	Premature birth	38	34	36
160	Injury at birth	186	226	201
161	Other diseases peculiar to early infancy.	178	169	174
	(*a*) Atelectasis	187	161	177
	(*b*) Icterus neonatorum	119	140	127
	(*c*) Other diseases included under 161.	203	200	202
	(1) Diseases of the umbilicus.	419	346	391
	(2) Pemphigus neonatorum.	—	—	—
162	**XVI.—Old Age ... ...**	**13**	**14**	**13**
163–198	**XVII.—Deaths from Violence.**	**285**	**276**	**282**
163–171	Suicide	237	302	257
163	By solid or liquid poisons and corrosive substances.	519	428	480
164	By poisonous gas ...	262	259	261
165	By hanging or strangulation.	129	173	138
166	By drowning	200	231	211
167	By firearms	159	200	160
168	By cutting or piercing instruments.	130	144	132
169	By jumping from high places.	422	500	452
170	By crushing	193	409	229
171	By other means ...	182	671	605
172–175	Homicide	690	634	657
172	Infanticide (under 1 year).†			
173	By firearms	833	417	556
174	By cutting or piercing instruments.	600	565	579
175	By other means ...	697	682	688
176–194	Accidental deaths ...	287	241	272
176	Attack by venomous animals.	240	211	227
177	Food poisoning... ...	833	167	611
178	Accidental absorption of irrespirable or poisonous gas.	575	483	543
179	Other acute accidental poisoning (not by gas).	544	592	566
180	Conflagration	300	125	239
181	Accidental burns (conflagration excepted).	112	102	106
182	Accidental mechanical suffocation.	661	597	638
183	Accidental drowning ...	174	191	176
184	Accidental injury by firearms.	224	—	214
185	Accidental injury by cutting or piercing instruments.	100	500	214
186	Accidental injury by fall, crushing, etc.	282	233	266
187	Cataclysm	—	—	—
188	Injury by animals (poisoning by venomous animals excepted).	351	500	366
189	Hunger or thirst ...	778	500	727
190	Excessive cold	200	143	189
191	Excessive heat	204	189	199
192	Lightning	154	—	133
193	Electricity (lightning excepted).	333	429	343
194	Other and unstated forms of accidental violence.	548	712	598
	(1) Inattention at birth	885	936	909
195	Violent deaths of unstated nature (i.e., accidental, suicidal, etc.).	444	572	480
196	Wounds of war ...	405	—	—
198	Execution	444	—	—
199–200	**XVIII.—Ill-defined Diseases.**	**75**	**55**	**66**
199	Sudden death	98	35	71
200	Cause of death unstated or ill-defined.	67	61	64

† Deaths from this cause are included under headings 173–175 (Homicide).

certifying practitioner that he may at a later date be in a position to afford information as to the cause of death additional to that in his certificate, thus providing for cases where the autopsy or other pathological examination was not complete at the time of framing the certificate. Diagnosis was thus stated or ascertained to have been confirmed after death or by operation in 11·7 per cent. of all deaths in 1933, 13·4 per cent. for males and 10·0 for females. The corresponding percentages in 1928 were 11·9 for persons, 13·2 for males and 10·6 for females.

The proportions vary greatly for different causes of death. Thus for the group of infectious and parasitic diseases the proportion per 1,000 deaths was 74, for cancer 150, aortic valve disease 195, coronary disease 274, fatty heart 414, peptic ulcer 433, appendicitis 456 and pericarditis 543. It must be remembered that no account is taken in these rates of confirmation of diagnosis during life by bacteriological, radiological or other means except by an operation so recent or important in its effects as to be mentioned on the death certificate. The more complete the confirmation during life becomes the smaller need there is for post mortem confirmation, and it follows that a decline of a rate in the table compared with 1928 may be the outcome of increasing resort to confirmatory methods of establishing the diagnosis before a fatal issue is reached. In other instances it may indicate a decreasing resort to operative measures.

Noteworthy decreases in the rates of Table XCI. compared with 1928 are evident for typhoid fever (314 to 230), diphtheria (88 to 54), cancer, diseases of the pancreas and spleen, appendicitis, intestinal obstruction and urinary calculi. The rate for all sites of cancer has declined from 170 to 150, for cancer of the breast from 269 to 183, cancer of the skin from 115 to 82 and cancer of the female genital organs from 153 to 124.

On the other hand considerable increases since 1928 in the proportions per 1,000 confirmed are evident for acute poliomyelitis, tuberculosis of the central nervous system and intestines, disseminated tuberculosis, syphilis (204 to 266), septicæmia, rheumatic fever, diseases of the mouth and pharynx, and of the respiratory system, cirrhosis and acute yellow atrophy of the liver and injury at birth.

Inquests and Uncertified Deaths in 1933.

The changes which have occurred since 1881 in the proportions of deaths certified in various ways or remaining uncertified are outlined in Table XCII. The quinquennial figures represent averages of the rates for individual years. There has been a significant increase since 1928 in the proportion of deaths certified by coroners after *post-mortem* examination without inquest, from 1·41 to 1·92 per cent. (6,496 deaths in 1928, 9,528 in 1933). A corresponding fall has occurred in the proportion of deaths registered after inquest, though the actual number of such deaths was almost

the same in 1933 (31,391) as in 1928 (31,220), an increase in the violent deaths being almost offset by a decrease in deaths from other causes. In London, deaths certified by coroners after *post mortem* have increased from 2,031* to 2,909, in the county boroughs from 1,996* to 2,811, in other urban districts from 1,663* to 2,736 and in rural districts from 797* to 1,072. London inquest deaths have fallen, however, from 4,208* to 3,540, whereas those in other urban areas have increased.

Table XCIII analyses the inquest deaths according to sex, age and the class of area in which the death was registered, and Table XCV similarly analyses the deaths certified by coroners without an inquest, these being comparable with Tables LXXI and LXXIII in the Review for 1928 though the classification of causes is of necessity somewhat different.

In England and Wales as a whole, inquest deaths from violence numbered 22,158, an increase of 1,093 over the corresponding group† in 1928, whilst inquest deaths from causes other than violence totalled 9,233, a decrease of 922. Deaths from non-violent causes certified by coroners after *post mortem* examination numbered 9,490, an increase of 3,020 over the corresponding total in 1928. The transfer here indicated of non-violent deaths from the "inquest" to the "no inquest" group was evidently most pronounced for deaths due to circulatory disease, but was also shared by the respiratory and infantile groups as may be seen by comparing the details of Table XCV with the corresponding table for 1928. The increase or decrease in the numbers of deaths certified in each year by coroners (*a*) after inquest and (*b*) after *post mortem* without inquest, and the proportions in groups (*a*) and (*b*) per 1,000 total deaths from the causes specified, were as follows :—

	Increase or decrease in No. of deaths in 1933 compared with 1928.		Proportions in (*a*) or (*b*) per 1,000 deaths from the causes specified.			
			1928.		1933.	
	(*a*)	(*b*)	(*a*)	(*b*)	(*a*)	(*b*)
All causes	+171	+3,032	68	14	63	19
Nervous diseases ..	−374	+ 20	28	14	21	16
Circulatory disease ..	−416	+1,703	34	32	24	38
Respiratory disease ..	−130	+ 417	18	15	16	24
Digestive disease ..	No change	+ 134	28	14	29	19
Puerperal state ..	+ 28	+ 31	70	24	88	39
Malformations; infantile disease‡ ..	−107	+ 82	19	12	15	17
All causes except violence‡	−922	+3,020	23	15	19	20

* Non-civilians are excluded from these totals for 1928.

† Including "lack of care," No. 163, with the violent deaths in 1928.

‡ Lack of care (No. 163 in 1928) is classed with the violent deaths.

The increase in deaths assigned to circulatory diseases after *post mortem* without inquest (from 3,330 in 1928 to 5,033 in 1933) is partly accounted for by the transfer due to dispensing with an inquest and partly reflects the general increase, amounting to about 25 per cent. in the five years, in all deaths attributed to these causes.

Table XCVI shows in detail for which causes of death coroners more frequently dispensed with inquests in 1933, and for which causes the holding of an inquest was the general rule. Of deaths from violence, 98 per cent. were certified after inquest, and other causes with high inquest rates are tetanus, septicæmia, diseases of the thymus, chronic poisoning, chronic interstitial pneumonia, abortion and acute osteomyelitis. An inquest was dispensed with for more than half of the deaths referred to the coroner and assigned to diphtheria, syphilis, diseases of the thymus, meningitis, cerebral hæmorrhage, pericarditis, valvular heart disease, fatty heart, angina pectoris, aneurysm, arteriosclerosis, pneumonia and congestion of the lung, peptic ulcer, diseases of the pancreas, chronic nephritis, atelectasis and icterus neonatorum.

Table XCII.—Certified and Uncertified Deaths and Inquest Cases, in 1881–1910 and in 1915, 1920, 1925, 1928 and 1933.

	Proportion per 100 Deaths.			
	Certified by :—			
	Registered Medical Practitioners.	Coroners after Inquest.	Coroners after P.M.	Uncertified Deaths.*
1881–85 ..	90·86	5·38	—	3·76
1886–90 ..	91·34	5·55	—	3·11
1891–95 ..	91·58	5·86	—	2·56
1896–1900 ..	91·76	6·25	—	1·99
1901–05 ..	91·56	6·73	—	1·71
1906–10 ..	91·54	7·03	—	1·43
1915	91·67	6·96	—	1·37
1920	92·14	6·65	—	1·21
1925	92·08	6·91	—	1·01
1928	90·82	6·78	1·41	0·99
1933	90·81	6·32	1·92	0·95

Table XCIV analyses the uncertified deaths, and may be compared with Table LXXII in the Review for 1928. Most of the differences

* Deaths without certificate of registered medical practitioner in attendance (which since 1914 must be referred by Registrar to Coroner) where Coroner declined to hold inquest.

Table XCIII.—Inquest Cases registered in 1933 classified by

International List Number.	Cause of Death.	Total.	Males.	Females.	London.	County Boroughs.	Urban Districts.	Rural Districts.
	All Causes	31,391	20,792	10,599	3,540	11,012	10,889	5,950
1–44	Infections and parasitic diseases	1,284	917	367	126	539	403	216
45–55	Cancer and other tumours ..	455	276	179	71	196	139	49
56–69	General diseases	179	81	98	19	58	73	29
70–74	Diseases of blood, &c.	52	31	21	6	18	21	7
75–77	Chronic poisoning	52	35	17	10	22	14	6
78–89	Diseases of nervous system ..	806	469	337	71	315	296	124
90–103	,, ,, circulatory ,, ..	3,190	2,099	1,091	204	1,349	1,153	484
104–114	,, ,, respiratory ,, ..	922	631	291	98	418	280	126
115–129	,, ,, digestive ,, ..	741	465	276	120	271	250	100
130–139	Non-venereal genito-urinary diseases :—							
	Males	196	196	—	30	92	53	21
	Females	166	—	166	15	73	59	19
140–150	Diseases of pregnancy, childbirth, &c.	231	—	231	47	81	79	24
151–153	,, ,, skin, &c.	163	106	57	28	61	53	21
154–156	,, ,, bones and organs of locomotion ..	152	97	55	29	67	41	15
157	Congenital malformations ..	69	41	28	3	32	27	7
158–161	Diseases of early infancy ..	224	119	105	11	98	72	43
162	Old age	111	50	61	3	61	33	14
163–198	Deaths from violence	22,158	15,041	7,117	2,640	7,145	7,780	4,593
199–200	Ill-defined diseases	240	138	102	9	116	63	52
10	Diphtheria	14	8	6	1	9	4	—
11	Influenza	171	95	76	12	89	43	27
22	Tetanus	86	67	19	6	20	32	28
36 (*a*)	Septicæmia	420	286	134	40	157	140	83
45–53	Cancer	362	238	124	60	163	100	39
67	Diseases of thymus	44	33	11	5	7	20	12
79	Meningitis	32	16	16	1	16	8	7
82	Cerebral hæmorrhage, &c. ..	383	216	167	31	151	152	49
86	Infantile convulsions	81	45	36	1	39	23	18
92	Valvular disease of heart ..	528	355	173	28	196	214	90
93 *b* 1	Fatty heart	287	171	116	16	106	117	48
93(*b*) 2,3,(*c*)	Other myocardial disease (not acute)	966	539	427	37	461	315	153
94	Angina pectoris	788	619	169	59	345	281	103
96	Aneurysm	122	92	30	15	52	45	10
114 (*a*)	Chronic interst. pneumonia ..	105	99	6	1	47	35	22
140, 141	Abortion	126	—	126	29	41	44	12
145 (*a*)	Puerperal septicæmia	35	—	35	4	11	14	6
149	" Other accidents " of childbirth..	27	—	27	7	10	9	1
152	Cellulitis, &c.	120	80	40	16	52	34	18
154	Acute osteomyelitis	112	74	38	25	49	28	10
160	Injury at birth	83	40	43	5	33	32	13
161 (*a*)	Atelectosis	28	21	7	—	14	12	2

Sex, Age, Class of Area, and assigned Cause of Death.

0—	1—	5—	15—	25—	35—	45—	55—	65—	75 and upwards.	International List Number.
1,288	1,302	1,936	3,210	3,169	3,060	4,252	5,142	4,425	3,607	
42	77	136	118	133	181	217	228	107	45	1–44
2	6	7	16	29	46	90	132	93	34	45–55
25	11	7	13	14	18	23	31	27	10	56–69
3	4	8	5	7	5	2	7	10	1	70–74
—	—	—	1	5	9	13	12	11	1	75–77
82	31	38	53	72	92	98	144	129	67	78–89
3	3	14	51	79	195	527	832	943	543	90–103
131	35	47	32	39	89	157	164	129	99	104–114
48	55	85	62	55	76	129	131	73	27	115–129
5	4	3	5	6	13	30	48	56	26	130–139
—	1	4	3	20	17	28	32	34	27	
—	—	1	45	111	72	2	—	—	—	140–150
4	3	9	13	13	22	24	33	30	12	151–153
2	24	71	22	4	7	4	11	5	2	154–156
46	13	3	4	1	2	—	—	—	—	157
224	—	—	—	—	—	—	—	—	—	158–161
—	—	—	—	—	—	—	2	37	72	162
653	1,033	1,502	2,761	2,573	2,206	2,883	3,273	2,665	2,609	163–198
18	2	1	6	8	10	25	62	76	32	199–200
—	5	9	—	—	—	—	—	—	—	10
6	8	8	10	19	28	24	35	19	14	11
—	9	33	10	10	10	5	5	4	—	22
5	11	47	31	51	54	74	82	44	21	36(*a*)
1	—	3	6	16	28	74	116	86	32	45–53
23	6	7	5	2	—	—	1	—	—	67
6	6	6	2	5	2	3	2	—	—	79
—	—	1	5	12	43	58	100	111	53	82
74	7	—	—	—	—	—	—	—	—	86
—	—	5	25	24	47	87	143	136	61	92
—	—	1	5	7	24	62	82	81	25	93 (*b*) 1
—	—	—	3	15	34	113	223	315	263	93(*b*) 2,3,(*c*)
—	—	—	1	10	47	160	234	248	88	94
1	—	2	3	9	12	23	29	30	13	96
—	—	—	1	4	20	37	31	10	2	114 (*a*)
—	—	—	21	61	44	—	—	—	—	140, 141
—	—	—	7	19	9	—	—	—	—	145 (*a*)
—	—	—	9	9	8	1	—	—	—	149
3	3	6	6	6	15	21	25	26	9	152
2	21	64	17	4	1	2	1	—	—	154
83	—	—	—	—	—	—	—	—	—	160
28	—	—	—	—	—	—	—	—	—	161 (*a*)

Table XCIV.—Uncertified Deaths registered in 1933 classified by

International List Number.	Cause of Death.	Total.	Males.	Females.	London.	County Boroughs.	Urban Districts.	Rural Districts.
	All Causes	4,728	2,569	2,159	37	1,184	1,926	1,581
1–44	Infectious and parasitic diseases	220	113	107	1	69	81	69
45–55	Cancer and other tumours	69	32	37	—	22	21	26
56–69	General diseases	70	29	41	—	13	31	26
70–74	Diseases of blood, &c.	11	5	6	—	2	6	3
75–77	Chronic poisoning	2	—	2	—	—	2	—
78–89	Diseases of nervous system	497	287	210	1	111	204	181
90–103	,, ,, circulatory ,,	1,920	1,076	844	18	511	767	624
104–114	,, ,, respiratory ,,	313	151	162	1	106	110	96
115–129	,, ,, digestive ,,	106	61	45	1	34	40	31
130–139	Non-venereal genito-urinary diseases :—							
	Males	26	26	—	—	5	8	13
	Females	26	—	26	—	7	13	6
140–150	Diseases of pregnancy, childbirth, &c.	8	—	8	—	1	3	4
151–153	,, ,, skin, &c.	3	1	2	—	—	1	2
154–156	,, ,, bones & organs of locomotion	4	3	1	—	2	2	—
157	Congenital malformations	47	20	27	—	17	9	21
158–161	Diseases of early infancy	325	205	120	4	100	126	95
162	Old Age	255	93	162	8	39	114	94
163–198	Deaths from violence	44	21	23	—	5	25	14
199–200	Ill defined diseases	782	446	336	3	140	363	276
10	Diphtheria	10	6	4	—	5	5	—
11	Influenza	122	57	65	—	37	47	38
82	Cerebral hæmorrhage, &c.	288	157	131	—	53	125	110
85	Epilepsy	61	38	23	1	13	26	21
86	Infantile convulsions	116	70	46	—	35	45	36
92	Valvular disease of heart	280	141	139	6	60	113	101
93 (*b*) 1	Fatty heart	107	39	68	—	33	43	31
93(*b*) 2,3,(*c*)	Other myocardial disease (not acute)	728	390	338	2	238	270	218
94	Angina pectoris	365	268	97	6	111	145	103
95	Other disease of heart	305	164	141	4	38	141	122
97 (1) (2)	Arterio sclerosis with cerebral-vascular lesion	43	20	23	—	8	15	20
97 (3)	Arterio sclerosis without cerebral-vascular lesion	55	35	20	—	14	22	19
106	Bronchitis	192	84	108	—	71	62	59
107–9	Pneumonia	66	38	28	—	26	23	17
112	Asthma	31	15	16	—	4	14	13
117	Ulcer of stomach	17	12	5	—	5	8	4
118 (1)	Inflammation of stomach	15	7	8	—	6	4	5
119–20	Diarrhœa, enteritis	35	22	13	—	14	16	5
158	Congenital debility	47	32	15	—	11	20	16
159	Premature birth	222	140	82	3	74	90	55
160	Injury at birth	18	13	5	—	4	5	9
161 (*a*)	Atelectasis	22	11	11	1	6	6	9

Sex, Age, Class of Area, and assigned Cause of Death.

0—	1—	5—	15—	25—	35—	45—	55—	65—	75 and upwards.	International List Number.
571	72	78	59	73	135	405	841	1,328	1,166	
11	19	14	19	25	26	34	24	32	16	1–44
—	1	1	—	—	2	5	17	25	18	45–55
3	1	3	2	1	2	6	16	25	11	56–69
1	—	—	—	—	—	3	2	4	1	70–74
—	—	—	—	—	1	1	—	—	—	75–77
108	15	14	17	8	14	40	89	124	68	78–89
—	—	4	10	14	51	175	462	677	527	90–103
46	16	19	1	4	11	24	30	74	88	104–114
23	12	10	1	2	11	11	14	14	8	115–129
—	—	1	—	—	2	1	3	8	11	130–139
—	1	—	—	1	1	9	5	7	2	
—	—	—	1	3	3	1	—	—	—	140–150
1	—	—	—	—	—	1	1	—	—	151–153
—	—	1	1	—	—	—	1	1	—	154–156
38	3	1	3	2	—	—	—	—	—	157
325	—	—	—	—	—	—	—	—	—	158–161
—	—	—	—	—	—	—	2	43	210	162
5	3	3	1	—	—	4	2	4	22	163–198
10	1	7	3	13	11	90	173	290	184	199–200
—	7	1	1	—	1	—	—	—	—	10
6	5	9	8	4	12	19	15	28	16	11
—	—	1	2	2	3	27	76	114	63	82
2	1	3	13	6	11	11	6	4	4	85
104	12	—	—	—	—	—	—	—	—	86
—	—	1	6	11	16	32	69	93	52	92
—	—	—	—	—	2	18	41	36	10	93 (*b*) 1
—	—	1	2	—	9	36	125	260	295	93(*b*) 2,3,(*c*)
—	—	—	—	—	12	49	126	122	56	94
—	—	2	2	3	10	31	76	114	67	95
—	—	—	—	—	1	1	7	18	16	97 (1) (2)
—	—	—	—	—	—	1	5	25	24	97 (3)
20	3	1	—	1	3	12	17	57	78	106
25	12	15	1	1	3	3	2	1	3	107–9
—	—	1	—	2	3	4	7	9	5	112
—	—	—	—	—	3	4	8	1	1	117
2	1	—	—	—	2	5	—	5	—	118 (1)
17	9	4	1	1	1	1	1	—	—	119–20
47	—	—	—	—	—	—	—	—	—	158
222	—	—	—	—	—	—	—	—	—	159
18	—	—	—	—	—	—	—	—	—	160
22	—	—	—	—	—	—	—	—	—	161 (*a*)

Table XCV.—Deaths certified by Coroner after Post Mortem registered Cause of

International List Number.	Cause of Death.	Total.	Males.	Females.	London.	County Boroughs.	Urban Districts.	Rural Districts.
	All Causes	9,528	5,688	3,840	2,909	2,811	2,736	1,072
1–44	Infectious and parasitic diseases	565	355	210	228	157	132	48
45–55	Cancer and other tumours ..	344	170	174	145	84	85	30
56–69	General diseases	174	89	85	36	59	54	25
70–74	Diseases of blood, &c.	37	18	19	8	11	11	7
75–77	Chronic poisoning	4	3	1	—	1	3	—
78–89	Diseases of nervous system ..	607	327	280	146	164	216	81
90–103	,, ,, circulatory ,, ..	5,033	3,188	1,845	1,498	1,466	1,483	586
104–114	,, ,, respiratory ,, ..	1,332	792	540	411	463	332	126
115–129	,, ,, digestive ,, ..	497	289	208	174	121	146	56
130–139	Non-venereal genito-urinary diseases :—							
	Males	207	207	—	64	60	58	25
	Females	196	—	196	71	68	42	15
140–150	Diseases of pregnancy, childbirth, &c.	101	—	101	24	31	33	13
151–153	,, ,, skin, &c.	18	13	5	10	5	3	—
154–156	,, ,, bones and organs of locomotion ..	8	4	4	4	2	1	1
157	Congenital malformations ..	124	72	52	42	20	43	19
158–161	Diseases of early infancy	205	110	95	40	79	64	22
162	Old age	10	2	8	4	4	1	1
163–198	Deaths from violence	38	27	11	3	9	16	10
199–200	Ill defined diseases	28	22	6	1	7	13	7
10	Diphtheria	20	12	8	9	7	2	2
11	Influenza	133	71	62	62	33	24	14
23	Respiratory tuberculosis	232	159	73	96	64	58	14
34	Syphilis	66	43	23	32	21	9	4
45–53	Cancer	268	145	123	129	60	58	21
67	Diseases of thymus	84	55	29	5	36	28	15
79	Meningitis	38	27	11	10	12	12	4
82	Cerebral hæmorrhage, &c. ..	404	201	203	99	105	147	53
86	Infantile convulsions	40	18	22	1	19	16	4
89	Disease of ear, mastoid	42	28	14	19	6	12	5
90	Pericarditis	63	37	26	12	25	18	8
92	Valvular disease of heart	953	558	395	253	299	283	118
93 (*b*) 1	Fatty heart	631	356	275	85	187	239	120
93(*b*) 2,3,(*c*)	Other myocardial disease (not acute)	850	502	348	236	248	269	97
94	Angina pectoris	1,685	1,243	442	642	447	434	162
96	Aneurysm	336	201	135	118	105	89	24
97 (1) (2)	Arterio-sclerosis with cerebral-vascular lesion	182	96	86	79	52	42	9
97 (3)	Arterio-sclerosis without cerebral-vascular lesion	154	98	56	38	42	51	23
107–9	Pneumonia	1,018	606	412	309	383	241	85
111	Congestion and infarct of lung ..	85	54	31	7	24	38	16
114 (*a*)	Chronic interstitial pneumonia ..	6	6	—	—	—	3	3
117	Ulcer of stomach or duodenum ..	108	72	36	45	26	20	17
122	Hernia	105	64	41	43	19	30	13
128	Diseases of pancreas	34	20	14	13	5	12	4
131	Chronic nephritis	313	157	156	96	103	79	35
158	Congenital debility	28	13	15	4	7	11	6
159	Premature birth	60	34	26	14	25	14	7
160	Injury at birth	40	22	18	6	12	20	2
161 (*a*)	Atelectasis	53	29	24	10	26	12	5
161 (*b*)	Icterus neonatorum	8	4	4	2	3	2	1

in 1933, classified by Sex, Age, Class of Area, and assigned Death.

0—	1—	5—	15—	25—	35—	45—	55—	65—	75 and upwards.	International List Number.
825	229	240	250	368	651	1,392	2,137	2,239	1,197	
32	42	41	33	61	72	93	97	54	40	1–44
1	5	6	10	14	38	76	75	79	40	45–55
66	16	14	12	8	14	12	15	15	2	56–69
4	5	1	7	3	6	2	6	3	—	70–74
—	—	—	—	1	—	2	1	—	—	75–77
51	20	21	25	43	65	111	134	98	39	78–89
1	1	22	61	96	269	788	1,391	1,575	829	90–103
283	93	84	46	38	83	154	208	208	135	104–114
65	29	32	17	26	36	73	99	83	37	115–129
2	3	2	9	6	13	34	51	63	24	130–139
1	2	2	5	16	12	31	48	48	31	
—	—	—	15	49	36	1	—	—	—	140–150
—	1	2	1	2	2	3	3	3	1	151–153
—	—	2	2	1	—	2	1	—	—	154–156
102	8	8	4	2	—	—	—	—	—	157
205	—	—	—	—	—	—	—	—	—	158–161
—	—	—	—	—	—	—	—	1	9	162
11	3	3	2	1	2	6	4	1	5	163–198
1	1	—	1	1	3	4	4	8	5	199–200
1	10	9	—	—	—	—	—	—	—	10
7	7	5	5	9	18	25	23	19	15	11
3	5	5	13	37	32	45	54	23	15	23
5	—	—	5	3	13	14	11	7	8	34
1	1	2	1	6	22	56	66	76	37	45–53
57	11	10	4	2	—	—	—	—	—	67
6	5	6	5	3	1	5	3	3	1	79
1	—	4	5	15	45	92	112	93	37	82
34	6	—	—	—	—	—	—	—	—	86
8	5	7	5	5	4	1	6	—	1	89
—	—	3	5	3	3	7	18	14	10	90
—	—	10	21	35	71	163	258	260	135	92
—	—	—	3	11	35	115	169	209	89	93 (*b*) 1
—	1	—	9	16	40	110	204	275	195	93(*b*) 2,3,(*c*)
—	—	—	—	6	66	248	493	600	272	94
—	—	6	8	10	26	59	94	79	54	96
—	—	—	2	2	11	39	67	42	19	97 (1) (2)
—	—	—	1	1	5	16	44	47	40	97 (3)
247	82	78	36	26	57	114	133	148	97	107–109
11	1	1	6	4	8	10	23	14	7	111
—	—	—	—	—	3	2	—	1	—	114 (*a*)
—	—	3	2	4	15	20	28	22	14	117
12	6	6	1	2	4	15	20	27	12	122
1	—	1	1	1	3	11	5	8	3	128
—	1	2	9	11	14	56	82	92	46	131
28	—	—	—	—	—	—	—	—	—	158
60	—	—	—	—	—	—	—	—	—	159
40	—	—	—	—	—	—	—	—	—	160
53	—	—	—	—	—	—	—	—	—	161 (*a*)
8	—	—	—	—	—	—	—	—	—	161 (*b*)

Table XCVI.—Method of Certification. Cases per Thousand Deaths registered from the Same Cause.—1933.

International List Number.	Cause of Death.	By Registered Medical Practitioners.	By Coroners.		Uncertified.
			After Inquest.	After P.M. without Inquest.	
	All causes	908	63	19	10
1–44	Infectious and parasitic diseases	971	18	8	3
45–55	Cancer and other tumours	987	7	5	1
56–69	General diseases	969	13	13	5
70–74	Diseases of blood, &c.	979	11	8	2
75–77	Chronic poisoning	487	460	35	18
78–89	Diseases of nervous system	950	21	16	13
90–103	Diseases of circulatory system	924	24	38	14
104–114	Diseases of respiratory system	954	16	24	6
115–129	Diseases of digestive system	948	29	19	4
130–139	Non-venereal genito-urinary diseases:—				
	Males	969	14	15	2
	Females	958	18	21	3
140–150	Diseases of pregnancy, childbirth, &c.	870	88	39	3
151–153	Diseases of skin, &c.	907	82	9	2
154–156	Diseases of bones and organs of locomotion	817	170	9	4
157	Congenital malformations	938	18	32	12
158–161	Diseases of early infancy	952	14	13	21
162	Old age	978	6	1	15
163–198	Deaths from violence	19	977	2	2
199–200	Ill-defined diseases	201	183	21	595
10	Diphtheria	983	5	8	4
11	Influenza	982	7	6	5
22	Tetanus	173	827	0	0
23	Tuberculosis of respiratory system	979	11	8	2
34	Syphilis	918	30	50	2
36 (*a*)	Septicæmia	355	629	15	1
45–53	Cancer	989	6	4	1
67	Diseases of the thymus	163	288	549	0
79	Meningitis	924	32	38	6
82	Cerebral hæmorrhage, apoplexy, &c.	958	15	16	11
85	Epilepsy	872	78	22	28
86	Infantile convulsions	812	64	32	92
89	Diseases of the ear, &c.	939	33	27	1
90	Pericarditis	690	109	201	0
92	Valvular disease of heart	930	21	38	11
93 (*b* 1)	Fatty heart	599	112	247	42
93(*b*) 2,3,(*c*)	Other myocardial disease (not acute)	958	16	14	12
94	Angina pectoris	692	85	183	40
95	Other disease of the heart	925	20	15	40
96	Aneurysm	650	91	250	9
97 (1, 2)	Arterio sclerosis with cerebral-vascular lesion	973	10	14	3
97 (3)	Arterio sclerosis without cerebral-vascular lesion	964	13	17	6
106	Bronchitis	976	8	7	9
107–9	Pneumonia (all forms)	947	17	34	2
111	Congestion and hæmorrhagic infarct of lung	904	27	62	7
112	Asthma	969	12	2	17
114 (*a*)	Chronic interstitial pneumonia	629	344	20	7
117	Ulcer of stomach or duodenum	946	24	26	4
118 (1)	Inflammation of the stomach	954	20	8	18
119–120	Diarrhœa and enteritis	966	16	12	6
122	Hernia	945	31	22	2
128	Diseases of the pancreas	896	32	68	4
131	Chronic nephritis	954	18	25	3
140, 141	Abortion	559	333	103	5
145 (*a*)	Puerperal sepsis	936	44	20	—
149	Other accidents of childbirth	897	87	16	—
152	Cellulitis, acute abscess	831	159	9	1
154	Acute osteomyelitis	740	247	11	2
158	Congenital debility	941	18	15	26
159	Premature birth	968	6	6	20
160	Injury at birth	893	63	30	14
161 (*a*)	Atelectasis	905	26	49	20
161 (*b*)	Icterus neonatorum	933	3	27	37

Table XCVII.—Inquest Cases per Thousand Deaths registered from the same Cause.—1933.

International List Number.	Cause of Death.	Total.	Males.	Females.	London.	County Boroughs.	Urban Districts.	Rural Districts.
	All Causes	63	83	43	66	63	62	63
1–44	Infectious & parasitic diseases	18	25	11	16	20	17	19
45–55	Cancer & other tumours	7	9	5	10	9	6	4
56–69	General diseases	13	17	11	15	13	14	10
70–74	Diseases of blood, &c.	11	15	8	17	12	12	8
75–77	Chronic poisoning	460	461	459	833	512	350	333
78–89	Diseases of nervous system	21	25	17	23	24	20	16
90–103	,, ,, circulatory ,,	24	33	16	13	29	25	19
104–114	,, ,, respiratory ,,	16	21	11	16	19	15	14
115–129	,, ,, digestive ,,	29	33	23	37	30	28	22
130–139	Non-venereal genito-urinary diseases							
	Males	14	14	—	19	20	11	7
	Females	18	—	18	15	23	18	11
140–150	Diseases of pregnancy, childbirth, &c.	88	—	88	226	92	80	44
151–153	,, ,, skin, &c.	82	98	64	103	88	81	59
154–156	,, ,, bones & organs of locomotion	170	182	153	250	209	134	100
157	Congenital malformations	18	19	16	9	24	19	9
158–161	Diseases of early infancy	14	13	16	9	17	13	14
162	Old Age	6	7	6	3	12	5	3
163–198	Deaths from violence	977	983	964	992	985	973	963
199–200	Ill-defined diseases	183	189	175	391	339	116	127
10	Diphtheria	5	6	4	3	8	5	—
11	Influenza	7	9	6	5	11	5	6
22	Tetanus	827	882	679	1,000	870	842	757
36 (*a*)	Septicæmia	629	692	525	702	692	598	553
45–53	Cancer	6	8	4	8	8	5	3
67	Disease of thymus	288	330	208	385	125	377	387
79	Meningitis	32	26	41	13	42	21	41
82	Cerebral hæmorrhage, &c.	15	19	12	17	18	15	9
86	Infantile convulsions	64	60	70	32	87	46	63
92	Valvular disease of heart	21	33	12	12	24	24	17
93 (*b*) 1	Fatty heart	112	152	81	75	129	120	87
93(*b*) 2,3,(*c*)	Other myocardial disease (not acute)	16	19	13	4	21	15	14
94	Angina pectoris	85	98	58	42	117	85	66
96	Aneurysm	91	99	72	54	106	105	67
114 (*a*)	Chronic interstitial pneumonia	344	393	113	71	416	294	373
140, 141	Abortion	333	—	333	630	281	358	190
145 (*a*)	Puerperal septicæmia	44	—	44	69	40	46	36
149	" Other accidents " of childbirth	87	—	87	259	92	74	19
152	Cellulitis, &c.	159	188	121	165	193	134	132
154	Acute osteomyelitis	247	265	217	368	303	192	128
160	Injury at birth	63	49	85	41	71	66	52
161 (*a*)	Atelectasis	26	32	17	—	34	33	10

noticeable in such a comparison merely reflect changes of classification such as the transfer from " old age " to the ill-defined group of heart failure or syncope at ages over 70.

Table XCVIII indicates that of all deaths assigned to ill-defined causes, 595 per 1,000 were uncertified (675 in rural districts, 130 in London). Infantile convulsions followed next in order of the causes specified with 92 (none in London), then fatty heart with 42 and angina pectoris with 40 per 1,000.

Tables XCIII–XCV and XCVII–C are inserted in order, as on previous occasions, to place on record at quinquennial intervals for those specially interested the fullest available details regarding the deaths not certified on the ordinary certificate of death.

Table XCVIII.—Uncertified Deaths per Thousand Deaths registered from the same Cause.—1933.

International List Number.	Cause of Death.	Total.	Males.	Females.	London.	County Boroughs.	Urban Districts.	Rural Districts.
	All Causes	10	10	9	1	7	11	17
1–44	Infectious and parasitic diseases ..	3	3	3	0	3	3	6
45–55	Cancer and other tumours ..	1	1	1	—	1	1	2
56–69	General diseases	5	6	5	—	3	6	9
70–74	Diseases of the blood, &c. ..	2	2	2	—	1	3	3
75–77	Chronic poisoning	18	—	54	—	—	50	—
78–89	Diseases of nervous system ..	13	15	10	0	8	14	23
90–103	,, ,, circulatory ,, ..	14	17	12	1	11	17	24
104–114	,, ,, respiratory ,, ..	6	5	6	0	5	6	11
115–129	,, ,, digestive ,, ..	4	4	4	0	4	4	7
130–139	Non-venereal genito-urinary diseases—							
	Males	2	2	—	—	1	2	5
	Females	3	—	3	—	2	4	3
140–150	Diseases of pregnancy, childbirth, &c.	3	—	3	—	1	3	7
151–153	,, ,, skin, &c.	2	1	2	—	—	2	6
154–156	,, ,, bones, &c.	4	6	3	—	6	7	—
157	Congenital malformations	12	9	16	—	13	6	27
158–161	Diseases of early infancy	21	23	18	3	17	23	31
162	Old Age	15	14	16	9	8	17	22
163–198	Deaths from violence	2	1	3	—	1	3	3
199–200	Ill defined diseases	595	610	575	130	409	671	675
10	Diphtheria	4	5	3	—	4	6	—
11	Influenza	5	5	5	—	5	6	8
82	Cerebral hæmorrhage, &c. ..	11	14	9	—	6	12	20
85	Epilepsy	28	34	22	5	18	34	43
86	Infantile convulsions	92	93	89	—	78	90	126
92	Valvular disease of heart	11	13	10	3	7	13	19
93 (*b*) 1	Fatty heart	42	35	48	—	40	44	56
93(*b*) 2,3,(*c*)	Other myocardial disease (not acute)	12	13	10	0	11	13	20
94	Angina pectoris	40	42	33	4	37	44	66
95	Other disease of heart	40	50	33	7	17	49	62
97 (1) (2)	Arterio sclerosis with cerebral-vascular lesion	3	3	3	—	2	3	8
97 (3)	Arterio sclerosis without cerebral-vascular lesion	6	7	5	—	4	7	10
106	Bronchitis	9	8	10	—	9	8	15
107–9	Pneumonia (all forms)	2	2	2	—	2	2	4
112	Asthma	17	15	20	—	7	21	39
117	Ulcer of stomach or duodenum ..	4	4	5	—	4	6	6
118 (1)	Inflammation of stomach	18	18	17	—	20	13	27
119–120	Diarrhœa and enteritis	6	7	5	—	6	10	6
158	Congenital debility	26	30	21	—	17	29	43
159	Premature birth	20	23	17	3	18	24	26
160	Injury at birth	14	16	10	—	9	10	36
161 (*a*)	Atelectasis	20	17	26	10	15	16	44

Table XCIX.—Deaths certified by Coroner after Post Mortem per Thousand Deaths registered from the same Cause—1933.

International List Number.	Cause of Death.	Total.	Males.	Females.	London.	County Boroughs.	Urban Districts.	Rural Districts.
	All Causes	19	23	16	54	16	16	11
1–44	Infectious and parasitic diseases..	8	10	6	29	6	6	4
45–55	Cancer and other tumours ..	5	6	5	20	4	4	2
56–69	General diseases	13	19	10	28	13	11	9
70–74	Diseases of the blood, &c	8	9	8	23	7	6	8
75–77	Chronic poisoning	35	39	27	0	23	75	—
78–89	Diseases of nervous system ..	16	18	14	47	13	14	10
90–103	,, ,, circulatory ,, ..	38	49	27	96	32	32	23
104–114	,, ,, respiratory ,, ..	24	26	21	66	21	18	14
115–129	,, ,, digestive ,, ..	19	21	17	54	13	16	12
130–139	Non-venereal genito-urinary diseases—							
	Males	15	15	—	41	13	12	9
	Females	21	—	21	69	21	13	9

Table XCIX (*continued*).

International List Number.	Cause of Death.	Total.	Males.	Females.	London	County Boroughs.	Urban Districts.	Rural Districts.
140–150	Diseases of pregnancy, childbirth, &c.	39	—	39	115	35	34	24
151–153	,, ,, skin, &c.	9	12	6	37	7	5	—
154–156	,, ,, bones, &c.	9	7	11	34	6	3	7
157	Congenital malformations	32	33	30	131	15	30	24
158–161	Diseases of early infancy	13	12	14	32	13	12	7
162	Old age	1	0	1	4	1	0	0
163–198	Deaths from violence	2	2	1	1	1	2	2
199–200	Ill defined diseases	21	30	10	43	20	24	17
10	Diphtheria	8	9	6	25	6	3	6
11	Influenza	6	6	5	28	4	3	3
23	Respiratory tuberculosis	8	10	6	27	6	6	4
34	Syphilis	50	49	51	144	36	24	29
45–53	Cancer	4	5	4	18	3	3	2
67	Diseases of the thymus	549	550	547	385	643	528	484
79	Meningitis	38	44	28	128	32	32	24
82	Cerebral hæmorrhage, &c. ..	16	18	14	56	13	14	10
86	Infantile convulsions	32	24	43	32	42	32	14
89	Diseases of ear, mastoid	27	32	21	83	10	26	23
90	Pericarditis	201	187	226	316	217	164	160
92	Valvular disease of heart	38	51	28	107	36	32	22
93 (*b*) 1	Fatty heart	247	316	192	399	228	246	217
93(*b*) 2,3,(*c*)	Other myocardial disease (not acute)	14	17	11	28	11	13	9
94	Angina pectoris	183	197	152	462	151	131	104
96	Aneurysm	250	216	326	428	214	207	161
97 (1) (2)	Arterio sclerosis with cerebral-vascular lesion	14	15	13	64	12	9	3
97 (3)	Arterio sclerosis without cerebral-vascular lesion	17	20	14	47	13	16	12
107–9	Pneumonia (all forms)	34	36	31	86	31	25	20
111	Congestion and infarct of lung ..	62	92	39	25	55	89	67
114 (*a*)	Chronic interstitial pneumonia ..	20	24	0	—	—	25	51
117	Ulcer of stomach or duodenum ..	26	23	36	69	18	14	25
122	Hernia	22	26	18	76	12	18	14
128	Diseases of the pancreas	68	85	53	236	33	63	40
131	Chronic nephritis	25	25	24	63	23	18	14
158	Congenital debility	15	12	21	35	11	16	16
159	Premature birth	6	6	5	16	6	4	3
160	Injury at birth	30	27	35	49	26	41	8
161 (*a*)	Atelectasis	49	44	57	98	64	33	24
161 (*b*)	Icterus neonatorum	27	21	37	77	30	19	15

Table C.—Deaths certified by Coroner after Inquest or after Post Mortem without Inquest and Uncertified Causes of Death—Cases per cent. of Total Deaths from all causes registered at the same age—1933.

	Certified by Coroners.				
	After Inquest.			After P.M. without Inquest.	Uncertified Cases.
	Total.	Deaths from Disease.	Deaths from Violence.		
All ages	6·3	1·8	4·5	1·9	1·0
0—	3·5	1·7	1·8	2·2	1·5
1—	8·4	1·7	6·7	1·5	0·5
5—	16·4	3·7	12·7	2·0	0·7
15—	17·5	2·4	15·1	1·4	0·3
25—	14·2	2·7	11·5	1·6	0·3
35—	10·7	3·0	7·7	2·3	0·5
45—	8·7	2·8	5·9	2·8	0·8
55—	6·5	2·4	4·1	2·7	1·1
65—	4·0	1·6	2·4	2·0	1·2
75 and up	2·9	0·8	2·1	1·0	0·9

MEDICAL CERTIFICATION.

Under the title of " Medical Certification " a section has been included in each year's Statistical Review since 1928 inclusive, dealing with the extent to which the certification of a death by a medical practitioner is conditioned by the fact of his having seen the body of the deceased person either after death or within a reasonable period before the date of death. The circumstances under which it was arranged to include statistics on this subject were set out in the 1928 report, and figures for that year were given with a special degree of elaboration intended to serve as a datum line for comparison with any future occasion on which similarly full examination might be made. Since then, abridged summaries have appeared in each Statistical Review from 1929 to 1932, and on this, the sixth occasion the analysis has been extended to cover the fuller circumstances dealt with in the original reference of 1928.

It will be borne in mind throughout that the Regulations require a death to be reported to the Coroner if the medical attendant certifying the cause of death had seen the deceased neither after death nor within 14 days before death.

Table CI provides a comparative statement in regard to the immediate question upon which the figures are more specifically intended to bear, viz., the extent to which death registration and burial take place on the strength of the certificate of a medical attendant who has seen the body of the deceased after death. In any statistical analysis it is necessary for all practical purposes to group with such cases those where the death was the subject of a Coroner's inquest or post mortem examination, or came under review by a Coroner prior to registration and burial. These cases are, therefore, included under the head of " seen."

Table CI.—Summary of Certification of Deaths Registered, 1928 and 1933.

	Registered Medical Practitioner.		Inquest or Coroner's P.M. without Inquest.		Other Cases reviewed by Coroner.*		Total Deaths registered.			
							Number.		Percentage.	
	1928.	1933.	1928.	1933	1928.	1933.	1928.	1933.	1928.	1933.
Seen after Death ..	183,062	211,062	37,716	40,919	13,984	14,716	234,762	266,697	51·0	53·7
Not seen after Death	223,519	228,839	—	—	—	—	223,519	228,839	48·5	46·1
No statement ..	2,108	929	—	—	—	—	2,108	929	0·5	0·2
Total ..	408,689	440,830	37,716	40,919	13,984	14,716	460,389	496,465	100·0	100·0

* Includes all deaths of inmates of Mental Hospitals not subject to Inquest or Coroner's P.M. (9,406 in 1928 and 9,988 in 1933), and also all deaths without certificate of registered medical practitioner in attendance 4,578 in 1928 and 4,728 in 1933) where coroner decided to hold no inquest or P.M.

It will be observed that in 1933 the proportion of " seen " cases was 53·7 per cent. of the total deaths registered as compared with 51·0 per cent. five years ago. The figures have been subject to slight irregularity over the intervening period, the percentages for 1929 to 1932 being 49·7, 52·0, 51·8 and 52·7 respectively, but on the whole the advance, if slow, has been in a favourable direction.

The improvement in the proportion of " seen " cases is, of course, complemented by a decline in the " not seens," which stood in 1933 at 46·1 per cent. of the total. But, as was explained in 1928, this apparently high percentage requires important qualification in view of the varying circumstances it embraces. In the following table the " not seen " cases are analysed according to the interval between death and the time last seen alive by the certifying medical practitioner.

Table CII.—" Not Seen " after Death—Interval between Death and Date when last seen alive—1928 and 1933.

	Percentage of Deaths " Not Seen."		Percentage of total Deaths.	
	1928.	1933.	1928.	1933.
Same day	44·1	45·4	21·4	21·0
1 day before	39·6	40·0	19·2	18·4
2 days before	8·0	7·6	3·9	3·5
3–6 days before	6·3	5·6	3·1	2·6
7 or more days before ..	2·0	1·4	0·9	0·6
Total seen after death or seen alive on same day as death			72·4	74·7
Total seen after death or seen alive within 1 day of death			91·6	93·1
Total seen after death or seen alive within 2 days of death			95·5	96·6

The distribution of the " not seens " according to the interval categories used in the table is very similar in the two years compared, but such change as is disclosed may be said to be favourable rather than otherwise, since the proportions at the shorter durations have increased, and those at the longer intervals declined. In 45·4 per cent. of the " not seen " cases of 1933 the deceased was actually seen on the very day of death, and in another 40·0 per cent. on the day before. Many of those seen on the day before death must, of course, have been seen within a few hours only of death since the day runs from midnight to midnight. It thus becomes clear that of the 228,839 deaths returned in Table CI as " not seen," in 85·4 per cent., or 195,410 cases, the deceased was seen alive by the medical

attendant on the day of death or the day before, and if these cases, representing 39·4 per cent. of the total deaths, are added to those seen after death, as conforming to a standard which satisfies reasonable requirements, the proportion of such cases is increased to 93·1 per cent. as compared with 91·6 per cent. in 1928. Further, if those seen alive within two days of death are added, the total is increased to 96·6 per cent. (95·5 in 1928).

A further circumstance which is of importance in the consideration of the 228,839 cases returned as " not seen " after death lies in the fact that a substantial portion, viz., 75,815, were in respect of deaths which occurred in hospitals and other residential institutions. Such grounds of dissatisfaction as may be felt in regard to the less satisfactory types of certification can hardly apply to the case of deaths under the care and organised attention which is afforded in the institutions in question. The statutory certificate of cause of death must be given by the practitioner in attendance upon the deceased during his last illness, and where in the course of institutional routine the deceased is seen after death by some other practitioner than the practitioner who attended him in life, the latter, who should normally give the certificate required, would be unable to certify that he had seen the deceased after death.

The following table compares the incidence of the " not seens " in institutions and in private practice :—

Table CIII.—Proportion of " Not Seens " (Coroners' Cases and " No Statement " cases excluded).

	Public Assistance Institutions.	Voluntary Hospitals.	Public Assistance Institutions and Voluntary Hospitals combined.	Private Practice.
	Per cent.	Per cent.	Per cent.	Per cent.
1928	63·6	30·2	49·3	57·3
1929	65·8	30·2	51·6	58·0
1930	65·2	29·7	50·0	56·0
1931	65·4	29·6	50·4	55·7
1932	65·2	29·8	50·4	54·6
1933	67·3	39·2	49·4	53·4

Beyond the fact that the proportions shown for Public Assistance Institutions have been about double those for Voluntary Hospitals over the whole period, and that the excess has tended to increase

rather than diminish, the 1933 record cannot properly be compared with those of preceding years owing to the fact that many infirmaries and other former Public Assistance Institutions which have been appropriated to Public Health Act or Maternity and Child Welfare purposes have now been transferred to the Voluntary Hospitals group. When the two categories are combined so as to eliminate the effect of transfers between them the institution proportion of "not seens," viz., 49·4 per cent. in 1933, is shown to be practically the same as it was in 1928, whereas the corresponding percentage assigned to private practice shows a fall from 57·3 to 53·4 during the same period.

When, however, the interval between death and the date last seen alive is taken into account, the differences suggested by the preceding table are considerably modified, as is shown by the following analysis :—

Table CIV.—Comparative Analysis of Proportions for Institutions and Private Practice of Cases "Seen" after Death and "Not Seen" after Death, but seen alive within Two Days of Date of Death (Coroners' Cases excluded), 1928 and 1933.

	Public Assistance Institutions.		Voluntary Hospitals.		Public Assistance Institutions and Voluntary Hospitals combined.		Private Practice.	
	1928.	1933.	1928.	1933.	1928.	1933.	1928.	1933.
Seen after Death ..	36·4	32·7	69·8	60·8	50·7	50·6	42·7	46·6
Seen alive on day of Death	33·6	34·0	17·6	22·9	26·8	26·9	23·1	21·9
Seen alive one day before Death	26·5	28·0	11·1	14·9	19·9	19·7	22·6	21·4
Total	96·5	94·7	98·5	98·6	97·4	97·2	88·4	89·9
Seen alive two days before Death	2·3	3·7	0·9	0·8	1·7	1·9	5·5	5·1
Total seen after Death or seen alive within two days of date of Death (though not seen after Death)	98·8	98·4	99·4	99·4	99·1	99·1	93·9	95·0

In respect of regional or district comparisons, the institution element is so frequently influenced by the practice of individual large institutions that local figures are of little relative value. The

records from private practice are free from this disability, and it is interesting to observe that the proportions of "seen" cases are highest in London, where they reach 69·5 per cent., and in neighbouring South Eastern Counties with percentages usually in excess of 60, whereas at the other extreme in the Northern Counties of Wales the figure falls below 30 per cent. With minor exceptions the local variations are much the same now as they were in 1928, though usually at an improved level, as is partially illustrated in the following table giving the proportions for certain Registration "Counties" (or aggregates of such "Counties") in which the percentage of "seen" in private practice is below 40. The figures are obtainable only by reference to existing registration units of area, and cannot, it is regretted, be given under present conditions for administrative areas.

Table CV.—Registration Sub-divisions in which the percentage of "Seen" Cases in Private Practice in 1933 was under 40.

Registration Sub-Division	Counties comprised in the Registration Sub-division.	Percentage of "Seen" cases.	
		1933.	1928.
XI *b*	Cardiganshire, Brecknockshire, Radnorshire, Montgomeryshire, Flintshire, Denbighshire, Merionethshire, Caernarvonshire and Anglesey	27·3	25·2
VI *b*	Staffordshire	29·7	28·2
VII *a*	Leicestershire, Rutlandshire and Lincolnshire	34·3	32·7
XI *a*	Monmouthshire, Glamorganshire, Carmarthenshire and Pembrokeshire	35·0	34·7
VII *b*	Nottinghamshire and Derbyshire	35·4	33·5
VI *c*	Worcestershire	35·5	32·1
VIII *c*	Lancashire (part of), viz.: Unions of Wigan, Warrington, Leigh, Bolton, Bury and Barton-upon-Irwell	36·1	35·0
X *a*	Durham	37·2	34·2
IX *c*	Yorkshire (part of), viz.: Unions of Wakefield, Pontefract, Hemsworth, Barnsley, Penistone, Wortley, Sheffield, Rotherham, Doncaster, Thorne, Goole, Selby and Tadcaster	37·7	33·3
IV *b*	Norfolk	38·7	34·5
III *b*	Northamptonshire, Huntingdonshire, Bedfordshire and Cambridgeshire	39·1	34·0

It will be observed from Table CI that the "No Statement" cases have diminished from 2,108 in 1928 to 929 in 1933, and now represent 2 per 1,000 of the total deaths registered. The decline in this unsatisfactory class has been progressive over practically the whole period, but its disappearance has not been quite so rapid or complete as had been originally anticipated. Nearly 60 per cent. of the current cases relate to institution deaths where their continued existence is of less significance in so far as they arise from the special circumstances attending institution certification which have already

been referred to, and it is more gratifying to note that the fall has been relatively greater amongst private practice certifications where the current 395 omissions are now but little more than 1 per 1,000 of the total deaths certified.

Table CVI.—Number of "Not Stated" Cases in Institutions and in Private Practice, 1928-1933.

Year.	Institutions.	Private Practice.	Total.
1928	1,091	1,017	2,108
1929	670	1,041	1,711
1930	692	645	1,337
1931	721	488	1,209
1932	390	218	608
1933	534	395	929

POPULATION.

The total population of England and Wales as at the 30th June, 1933, has been estimated at 40,350,000 persons, 19,357,000 being males and 20,993,000 females.

The current year's total is 149,000 in excess of the corresponding mid-1932 estimate and represents an estimated rate of growth of 0·37 per cent. per annum during the past year, a figure which may be compared with the 10-year increases of 5·53 per cent. and 4·93 per cent. recorded in respect of the decennia 1921–31 and 1911–21 respectively. (*See* General Tables Volume Census, 1931, Table I.)

The method adopted in arriving at the current estimates is that which has been used with apparent success in past periods and consists of taking the 1931 Census as a starting point, adding the births and immigrants and deducting deaths and emigrants between the date of the Census and the 30th June, 1933. Of the elements entering into the computation, the records of births and deaths are believed to be precise and complete, so that such estimation error as may be inherent in the final result may be regarded as attaching almost wholly to the allowances included in respect of migration. For the latter, recourse is had to the statistics of migration periodically compiled by the Board of Trade and to departmental records of the movements of the Defence Forces; these are incomplete however, in that they afford no guide to the passenger traffic between the several countries of the United Kingdom nor to the possible effect on the home population of changes in the personnel of the mercantile marine, the allowance for which is a matter of judgment based upon past experience qualified as may seem to be required by current conditions. The error to which the population estimates are subject is one which may be expected to grow in degree as the preceding census becomes more remote.

The mid-1933 population estimate of 40,350,000 is some 398,000 in excess of the 1931 census figure, of which excess about 264,000 may be assigned to natural increase, leaving 134,000 to be ascribed to the miscellaneous movements summed up in the term migration. It is of interest to observe (from Part II of the Statistical Review Table S) that the net balance of migration which for several decades has, on the whole, been consistently outward in character, appears since about 1930, to have shown a definite inward tendency, thus affording some numerical compensation for the continued decline in the numbers of births.

Age Distribution.—The estimated sex-age distribution of the national population, shown in Table 1 of Part I of the Tables section of this volume, has been obtained from a revised 1932 distribution based on graduated census figures by the survivorship method customarily adopted for the purpose; this briefly consists of (1) obtaining the year's deaths arising from the population at each age in 1932, and treating the survivors as the population at the next higher age in 1933, (2) completing the table by the addition of the population aged 0–1, represented by the survivors at the middle of 1933 of the births occurring between the middle of 1932 and the middle of 1933, and (3) adjusting the results of these two operations in respect of the balance of population movement in accordance with such age statistics as are available in respect thereof.

The average ages of the mid-1933 population according to the estimated age distribution are 32·2 and 33·9 for males and females respectively, figures which compare with averages of 31·8 and 33·5 in 1931 or 29·9 and 31·2 in 1921.

Local Populations.—The 1933 estimates of the populations of all Boroughs, Urban Districts and Rural Districts in England and Wales are shown in Table 17 of Part I and Table E of Part II of the Tables section of the current Annual Review.

As for the country as a whole, so for each of the component areas within the country the present mid-year estimate has been obtained by estimating the local movement which has taken place since the date of the 1931 census and modifying the 1931 position in respect of such movement. It may be mentioned that the local estimates purport to represent the resident populations of the several areas and are, in this respect, different from census populations as generally understood in this country, which consist simply of the persons enumerated in the several areas on census night, whether resident in the area of enumeration or not.

The principles and procedure governing the identification of the basic 1931 resident population and the estimation of the changes in that population which have taken place since 1931 are similar in all general respects to those adopted for the purpose of the 1932 estimates and for their fuller discussion reference may be made to the population section of the text portion of the Annual Review for 1932.

Non-Civilian Populations.—The merging of non-civilian and civilian deaths in the local mortality records from 1932 onwards has rendered unnecessary the identification of civilian apart from total populations, and the former, shown prior to 1932 in footnotes to Tables 17 and E, are accordingly now omitted.

Institutions.—In the Census classification of population according to residence, the populations of institutions, *e.g.*, Public Assistance Institutions, Infirmaries, Hospitals, Mental Institutions, etc., were dispersed to their home areas where it was anticipated that they would be discharged within a period of six months; otherwise they were retained in the Institution area. This convention is reflected in the current population estimates but is not precisely identical with the procedure in the areal classification of deaths where it is customary to transfer all institution deaths to former area of residence (if known) irrespectively of the time spent in the Institution.

Local Age Distributions.—Sex and age distributions for large geographical regions of the country, which formerly appeared in the text portion of the Review, are now shown in Table 2 of Part I. The populations at ages under five were obtained by the survivorship method (*see* page 164), and for later ages the predetermined total populations, obtained as described in the preceding section, were distributed in accordance with the recent census age and sex distribution of the unit, the resulting figures being thereafter modified to allow for the slight change between the date of the Census and the middle of the year (1933) in the age distribution of the total population of the country.

United Kingdom and Irish Free State.—The populations of each of the countries of the United Kingdom and of the Irish Free State as estimated by their respective Registrars-General, are shown for each year from 1894 in Table A.

MARRIAGES

The marriages registered in England and Wales during the year 1933 numbered 318,191, corresponding to a rate of 15·8 persons married per 1,000 of the population of all ages and conditions. The number so registered is 11,007, or 3·58 per cent. more than the number registered in 1932, and apart from the year 1915 and the years immediately following the war, 1919–1921, is the largest number in any year since the commencement of civil registration in 1837. (*See* Tables B and C.)

The preference for the third quarter, noticeable in the records since the beginning of the present century, was maintained in 1933, the marriages in this period being 32·4 per cent. of the total, while the fourth, formerly the outstanding favourite, now ranks third out of the four. The rate for the first quarter, 8·9 persons

married per 1,000 population, was lower than in any first quarter since 1837, and the actual number of marriages, 44,298, lower than in any first quarter since 1901. The proportion of marriages contracted in the first quarter was only 13·9 per cent. of the total.

In the following table (CVII) the marriages of a series of years are compared with the unmarried population at all ages over 15. By eliminating the progressively falling proportion of children under 15 from the population at risk, the rates of recent years are scaled down slightly in relation to those of earlier periods, but the principal interest of the table is in showing the difference in the course of the rates as between the two sexes. The actual difference between the male and female ratios is of course due to the inequality of the numbers of unmarried men and women in the population, and since the former have always been in a minority—which has been unduly exaggerated as a result of the

Table CVII.—Annual Number of Marriages of Men and Women per 1,000 Unmarried Population of each Sex aged 15 and over, 1871–1933.

NOTE.—For the census years 1871 to 1931 the annual numbers of marriages have been taken as the average of the three years about each census. From 1920 the rates for individual years are shown.

Year.	Bachelors, Widowers, Spinsters and Widows.	Bachelors and Widowers.	Spinsters and Widows.
1871	57·2	62·3	52·9
1881	51·5	56·0	47·6
1891	49·8	54·6	45·7
1901	48·7	53·5	44·7
1911	46·3	50·8	42·5
1921	54·1	62·7	47·6
1931	46·7	53·3	41·5
1920	61·7	71·5	54·7
1921	52·1	60·4	45·8
1922	48·2	55·8	42·5
1923	46·6	53·9	41·1
1924	46·6	53·6	41·2
1925	46·2	53·3	40·9
1926	43·4	50·0	38·3
1927	47·5	54·8	41·9
1928	46·4	53·7	40·9
1929	47·7	55·2	41·9
1930	47·8	55·6	42·0
1931	46·8	53·4	41·6
1932	46·1	52·6	41·1
1933	48·1	54·9	42·8

war—it is their numbers which primarily determine the marriage-ability of the population, so that, from one point of view, the male ratios may be regarded as providing the better indexes to the variations which have occurred from time to time in the incidence of marriage. In Table C (Part II), the series is taken back to 1893.

Fluctuations of the general Marriage-rate in different Sections of the Country.—In Table CVIII comparison is made of the year's marriages and marriage-rates in large geographical sections of the country, and an analysis of the rates in regions and counties is shown in Table F.

The determination of marriage-rates for localities is not wholly satisfactory. In a large proportion of cases the district of registration is the district of residence of only one of the parties and in some cases of neither. This difficulty, however, is probably of less moment in comparisons between large sections of the country than between smaller areas.

Among males, the highest frequencies occur in North III and Midland II, which retain the position they held in 1932, but in reverse order. Among females the highest places are occupied by Wales I and North I. The lowest frequency, for both males and females, is recorded in Wales II.

From the analysis in Table F it will be seen that, among the counties there compared, the 1933 marriage-rate was highest in

Table CVIII.—Marriage-rate per 1,000 Unmarried Population aged 15 and over in Geographical Sections of the Country.*—1932 and 1933.

Area.	Ratio of unmarried males per 1,000 unmarried females aged 15 and over (Census 1931).	Rate per 1,000 Unmarried Population aged 15 and over.				Ratio of local rate to England and Wales rate (taken as 1,000).			
		1932.		1933.		1932.		1933.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
England and Wales.	778	52·6	41·1	54·9	42·8	1,000	1,000	1,000	1,000
South-East ..	711	53·7	38·3	56·3	40·2	1,021	932	1,026	939
North	796	52·8	42·2	55·1	44·0	1,004	1,027	1,004	1,028
North I ..	959	50·5	48·7	54·1	52·1	960	1,185	985	1,217
North II ..	866	47·1	40·9	48·1	41·9	895	995	876	979
North III ..	794	55·9	44·6	57·9	46·2	1,063	1,085	1,055	1,079
North IV ..	736	53·2	39·3	55·5	41·0	1,011	956	1,011	958
Midland ..	807	54·2	43·9	56·3	45·6	1,030	1,068	1,026	1,065
Midland I ..	797	53·3	42·7	55·9	44·7	1,013	1,039	1,018	1,044
Midland II ..	826	56·0	46·4	57·1	47·3	1,065	1,129	1,040	1,105
East	878	48·0	42·3	50·6	44·6	913	1,029	922	1,042
South-West ..	743	50·7	37·8	51·5	38·4	964	920	938	897
Wales	986	46·5	46·0	49·0	48·5	884	1,119	893	1,133
Wales I ..	1,060	48·4	51·6	51·5	54·9	920	1,256	938	1,283
Wales II ..	833	41·4	34·6	42·3	35·4	787	842	770	827

* For the constitution of the several sections, *see* page 6.

London, where it exceeded the mean for the country by 20·3 per cent. followed in order by Bedfordshire, Glamorganshire, Warwickshire and the West Riding of Yorkshire, with excesses ranging from 2·5 to 4·4 per cent. The lowest rates occur in Wales where the counties of Anglesey, Cardigan, Merioneth, Montgomery and Radnor all return lower rates than any among the English counties.

The City of London returns a rate nearly four-and-a-half times as high as the average, and of the Metropolitan Boroughs several have high rates, notably Holborn and Westminster, where rates more than twice the average are found. Such rates give support to the belief that many persons who usually live in the provinces or abroad come to London to be married. At the census of 1931 these three areas returned higher proportions of population living in hotels, boarding-houses, etc., than any of the other Metropolitan Boroughs. Only three of the Metropolitan Boroughs—Bethnal Green, Lewisham and Stoke Newington—have rates which are lower than the average for England and Wales. Among the county boroughs distinguished, the highest rates occur in Leicester, Reading and Brighton, and the lowest in Barrow-in-Furness and Canterbury.

Marriage rates by ages, which provide a more exact statement of the incidence and intensity of marriage than the aggregate rates just considered, are shown in Table CIX. The rates for 1871 to 1931, being based on enumerated populations, are liable to rather smaller errors than those for 1932 and 1933 which are based on post-censal estimates of population.

It will be observed from the last column of Table CIX, which compares the actual marriages of each year with a standard number, viz., those expected according to the age rates of 1921, and which makes allowance, therefore, for the changing age constitution of the unmarried population, that of the four sections distinguished, bachelors, widowers, spinsters and widows, the 1933 frequencies are all lower than those of 1921, the percentages to the 1921 frequencies being, in order, spinsters 99·6, widowers 84·8, bachelors 82·9, and widows 70·5. On this basis of comparison the marriage frequency among bachelors is higher than in 1901 but lower than in previous years; that for widowers lies between the ratios of 1901 and 1911; that for spinsters lies between the ratios of 1881 and 1891; while that for widows differs only slightly from the ratio of 1932, and is much lower than any previously recorded for this class in the table.

From the age analysis shown in the earlier columns of Table CIX, it will be seen that the 1933 rates for all four sections have decreased as compared with those for 1921 in all age-groups from 20 to 55 (except for spinsters, aged 25–35), and that the decrease among bachelors, widowers and widows is continued into the final group, age 55 and over. The only noteworthy increase occurs among spinsters under 20 years of age. The maintenance of

the marriage-rate of young spinsters at a point well in excess of the corresponding rates of pre-war years has been a feature of the returns of recent years. With both bachelors and spinsters, the

Table CIX. — Annual Marriage-rate per 1,000 Bachelors, Widowers, Spinsters and Widows respectively at each of several Age Periods, 1871–1933.

NOTE.—Prior to 1921 the annual numbers of marriages have been taken as the average of the three years about each Census.

Year.	Annual marriage-rate per 1,000 in each age group.						Marriage-rate per 1,000 population over 15 in each class.	Ratio to corresponding rate for 1921.	Marriage-rate which would have resulted had the 1921 age rates been in operation.	Ratio of actual marriage rate (Col. 8) to rate in previous column (10).
	15—	20—	25—	35—	45—	55 and over.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
				BACHELORS.						
1871 ..	6·0	122·4	119·3	43·3	15·3	3·2	61·7	987	62·3	990
1881 ..	4·6	106·8	112·4	40·5	14·3	3·0	55·7	891	62·4	893
1891 ..	3·1	94·7	122·4	43·4	15·2	3·5	54·8	877	63·8	859
1901 ..	2·5	85·9	123·7	44·2	14·6	3·3	54·7	875	66·6	821
1911 ..	2·2	74·8	120·6	44·4	14·9	3·9	52·6	842	69·2	760
1921 ..	3·4	94·4	161·1	61·6	19·7	5·5	62·5	1,000	62·5	1,000
1931 ..	3·3	72·3	140·3	52·7	18·1	5·7	56·2	899	67·7	830
1932 ..	3·4	69·7	136·9	51·1	16·9	5·2	55·5	888	68·7	808
1933 ..	3·4	70·4	142·2	51·3	18·3	5·4	58·2	931	70·2	829
				WIDOWERS.						
1871 ..	11·5	229·0	288·5	181·5	88·3	15·9	65·8	1,475	56·0	1,175
1881 ..	30·6	192·9	246·5	157·8	76·9	16·0	58·2	1,305	56·0	1,039
1891 ..	14·1	153·4	231·7	151·1	74·7	15·5	53·4	1,197	53·7	994
1901 ..	—	132·6	201·7	134·1	65·3	13·5	44·4	996	51·0	871
1911 ..	—	121·6	171·2	117·9	59·4	12·7	36·9	827	47·4	778
1921 ..	14·3	163·7	229·3	155·2	73·5	15·8	44·6	1,000	44·6	1,000
1931 ..	62·5	98·1	179·8	122·3	65·4	14·8	33·1	742	38·5	860
1932 ..	—	103·9	177·6	124·3	62·7	14·0	31·8	713	38·1	835
1933 ..	—	95·3	177·2	125·6	64·9	14·2	31·9	715	37·6	848
				SPINSTERS.						
1871 ..	26·8	133·7	85·9	30·4	11·9	1·7	63·1	1,164	55·8	1,131
1881 ..	21·5	121·9	80·6	26·3	10·4	1·6	56·9	1,050	55·8	1,020
1891 ..	16·2	112·4	85·7	26·4	10·3	1·7	54·4	1,004	57·1	953
1901 ..	12·9	104·9	88·6	25·3	9·1	1·5	53·0	978	58·6	904
1911 ..	11·2	97·7	91·1	24·4	8·5	1·8	50·6	934	58·0	872
1921 ..	14·8	114·4	100·0	25·6	8·9	2·0	54·2	1,000	54·2	1,000
1931 ..	17·1	106·9	97·2	22·3	8·3	2·2	51·9	958	53·9	963
1932 ..	17·7	105·1	96·4	22·1	7·8	2·1	51·6	952	54·1	954
1933 ..	18·7	109·2	101·2	22·5	8·1	2·3	54·3	1,002	54·5	996
				WIDOWS.						
1871 ..	55·4	170·5	125·5	55·7	20·8	2·6	21·1	1,172	19·6	1,077
1881 ..	56·6	155·3	114·5	50·2	18·6	2·6	18·2	1,011	18·5	984
1891 ..	49·3	150·4	114·3	50·3	17·8	2·4	16·3	906	16·8	970
1901 ..	54·9	140·7	115·9	48·9	15·6	2·1	14·4	800	15·6	923
1911 ..	30·0	151·2	114·1	48·9	15·6	2·1	12·5	694	13·6	919
1921 ..	36·1	191·4	120·3	50·6	17·6	2·5	18·0	1,000	18·0	1,000
1931 ..	57·1	140·8	93·0	33·2	13·6	2·2	8·7	483	11·7	744
1932 ..	14·3	153·2	84·8	31·9	12·3	2·1	8·0	444	11·4	702
1933 ..	45·5	137·7	87·0	32·2	12·2	2·1	7·9	439	11·2	705

rates for the age period 25–35, at which practically one-half and one-third respectively of the marriages of these classes take place, are higher than those of any pre-war year shown in the table, while for bachelors the excess extends to all higher ages. For both classes the rates show an increase over those of 1932 at all ages except for bachelors under 20 at which 3·4 is shown for both years.

Widowers' and widows' rates as compared with 1921 show a consistent fall in all the age divisions identified except widows at 15–20 where the numbers are insignificant. Widowers' rates are largely in excess of the corresponding bachelors' rates, except under 20 years of age, so that it may be said that re-marriages in the case of males are relatively more frequent than first marriages. As compared with 1932, most of the rates are slightly higher, the chief exception being at ages 20–25 where rather substantial decreases occur, but having regard to the small numbers of marriages among those classes at 20–25, the decreases are probably of little significance.

Comparison of the rates for spinsters and widows shows that the latter have the advantage in all age groups except at 25–35 and 55 and over. The age analysis serves to call attention to the misleading nature of the comparison suggested by the aggregate marriages per 1,000 population shown in column 8 of Table CIX; owing to the concentration of the single population at the younger ages where marriages are numerous, and the widowed population at the later ages where they are few, the aggregate rate for the single of each sex appears to be vastly in excess of that of the widowed, whereas, if allowance be made for the difference in their age constitutions, the relative positions are modified and, for all age-groups among males and nearly all age-groups among females, are in favour of the widowed.

Table CX shows how the proportions of first marriages and re-marriages have varied from 1918 to 1933. In 1933 there was a higher proportion of first marriages, and consequently, a lower proportion of re-marriages, than in any of the previous years. This trend is observable for both sexes, and especially for women, since 1919.

Tables L and K, which now appear in Part II of this Review, continue the series shown in previous issues of the Text Volume (Tables LXXXVI and LXXXVII in the volume for 1930). They classify by age the marriages of a number of years, the former giving the mean ages of the persons married in each of the possible combinations and the latter extending the analysis into a number of age-groups. Table K shows that, during the last 45 years or so, the modal age of marriage has tended to increase steadily. In each of the four sections the proportion marrying under 21 years of age has decreased. For bachelors, the most popular age has passed from 21–25 to 25–30, and for widowers, from 35–40 to 50–55; while for spinsters and widows, although the modal group has not changed

—being throughout 21–25 for the former and 35–40 for the latter —the position of the mode has risen within the group. The distribution for 1933 as shown in Table K, and the average ages shown in Table L fluctuate in no significant way from the data of the previous few years.

Table CX.—Proportions of First Marriages and Re-marriages in 1,000 Marriages, 1918–1933.

Year.	Men.		Women.		Bachelors who married.		Widowers who married.	
	Bachelors.	Widowers.	Spinsters.	Widows.	Spinsters.	Widows.	Spinsters.	Widows.
1918	901	99	894	106	837	64	57	42
1919	897	103	875	125	816	81	59	44
1920	907	93	894	106	839	68	55	38
1921	911	89	909	91	855	56	54	35
1922	913	87	920	80	866	47	54	33
1923	915	85	929	71	875	40	54	31
1924	916	84	932	68	880	36	53	31
1925	916	84	937	63	884	32	53	31
1926	917	83	940	60	887	30	53	30
1927	918	82	942	58	890	28	52	30
1928	921	79	943	57	893	28	50	29
1929	920	80	946	54	894	26	51	29
1930	923	77	949	51	897	25	51	27
1931	924	76	950	50	900	24	50	26
1932	925	75	953	47	903	22	50	25
1933	926	74	954	46	904	22	50	24

Table G (Part II, p. 61) shows that more men married at age 25 and more women at age 23 than at any other age. Table J (Part II, p. 63) shows the ages of husbands and wives in combination. Among those under 25, for whom the data are given by single years of age, there is a tendency for brides to be about a year younger than bridegrooms.

Marriages of Minors.—Of the males married during the year, 12,981, or 4·08 per cent., were under the age of 21, and of the females 50,227, or 15·79 per cent., as compared with 4·36 per cent., and 16·04 per cent. last year respectively (*see* Tables M and CXI). The male rate is lower than any recorded since 1925. Females, who have always greatly outnumbered the males in this class—in the present year the ratio is nearly 4 to 1 —naturally show the highest rates and the greatest changes in the rate; they formed 18·8 per 1,000 of the unmarried and widowed

Table CXI.—Minors Married per 1,000 Marriages at all Ages, 1876–1933.

Year.	Husbands.	Wives.	Year.	Husbands.	Wives.
1876–80 ..	77·8	217·0	1920 ..	46·8	142·9
1881–85 ..	73·0	215·0	1921 ..	48·2	149·2
1886–90 ..	63·2	200·2	1922 ..	44·4	144·4
1891–95 ..	56·2	182·6	1923 ..	42·5	142·9
1896–1900 ..	51·2	168·0	1924 ..	40·4	140·3
1901–05 ..	46·3	153·1	1925 ..	40·6	142·3
1906–10 ..	40·3	139·4	1926 ..	43·3	147·5
1911–15 ..	39·2	136·6	1927 ..	41·4	146·1
1916–20 ..	42·6	133·3	1928 ..	43·5	151·5
1921–25 ..	43·3	143·9	1929 ..	41·8	151·7
1926–30 ..	42·5	150·5	1930 ..	42·6	155·3
1917	41·7	134·2	1931 ..	43·5	158·5
1918	42·6	129·0	1932 ..	43·6	160·4
1919	43·7	129·4	1933 ..	40·8	157·9

females aged 15–21 in 1911, were 26·6 in 1920, and are now 27·1, while the corresponding rates for males were 5·5, 8·8 and 6·8 per 1,000 respectively (*see* Table CXII).

Comparative figures are shown in Table CXII for certain years back to 1901, before which the age-group 15–21 was not identified in the population returns; an indication of the trend of youthful marriage-rates in earlier periods may be gained from Table CXI.

Table CXII.—Annual Marriage-rate per 1,000 Unmarried and Widowed Persons in the age-group 15–21 in 1901, 1911, 1921, 1931 and 1927–33.

Year.	Males.		Females.	
	Rate.	Ratio to 1921. Per Cent.	Rate.	Ratio to 1921. Per Cent.
1901	6·7	87	21·6	92
1911	5·5	71	18·8	80
1921	7·7	100	23·4	100
1931	6·7	87	24·8	106
1927	6·0	78	21·6	92
1928	6·2	81	22·1	94
1929	6·2	81	23·0	98
1930	6·4	83	24·0	103
1931	6·7	87	24·8	106
1932	6·8	88	25·4	109
1933	6·8	88	27·1	116

The proportions of males and females marrying under age are summarised for regions in Table CXIII, and the numbers are stated in Table M. Much of the variation there shown is but a reflex of the incidence of the general marriage-rate (Table CVIII), and regard must necessarily be had to the latter in considering how far the former provides evidence of local custom regarding early marriage. In 1933 the three areas in which the proportion of male minors marrying was highest were, in order, North III, Wales I and Midland II. For females, the corresponding areas were Wales I, North I, and North II.

Table CXIII.—Marriage-rate of Minors per 1,000 Unmarried Population aged 15–21 in Geographical Sections of the Country, 1932 and 1933.

Area.	1932.				1933.			
	Rate per 1,000 Unmarried Population 15–21.		Ratio of local rate to England and Wales rate taken as 1,000.		Rate per 1,000 Unmarried Population 15–21.		Ratio of local rate to England and Wales rate taken as 1,000.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
England and Wales.	6·8	25·4	1,000	1,000	6·8	27·1	1,000	1,000
South-East	5·9	22·4	868	882	5·7	23·9	838	882
North ..	7·7	27·3	1,132	1,075	7·8	28·8	1,147	1,063
North I ..	7·8	34·5	1,147	1,358	7·1	36·7	1,044	1,354
North II ..	7·5	29·7	1,103	1,169	7·8	31·7	1,147	1,170
North III ..	8·0	28·7	1,176	1,130	8·4	29·8	1,235	1,100
North IV ..	7·5	23·5	1,103	925	7·8	25·1	1,147	926
Midland ..	7·0	25·2	1,029	992	7·4	27·0	1,088	996
Midland I ..	6·4	23·5	941	925	7·1	25·8	1,044	952
Midland II	8·0	28·3	1,176	1,114	7·9	29·3	1,162	1,081
East	6·8	28·6	1,000	1,126	6·8	31·4	1,000	1,159
South-West ..	6·0	25·7	882	1,012	5·6	25·9	824	956
Wales ..	6·5	31·3	956	1,232	7·1	34·4	1,044	1,269
Wales I ..	7·6	34·7	1,118	1,366	8·0	38·6	1,176	1,424
Wales II ..	3·3	21·8	485	858	4·3	22·5	632	830

Divorces and Remarriages of Divorced Persons.—The annual numbers of marriages dissolved or annulled are shown in Table O and again in Table CXIV in terms of the persons involved, for each of the past thirteen years and for each quinquennium back to 1876–80.

During the year 1933, 3,934 divorces and 108 annulments were obtained, the number of persons involved being twice these figures, or a total of 4,042 of each sex.

The number of divorces is higher than that recorded in any previous year—though only slightly greater than the earlier record of 1928—and is more than four times as great as in 1916.

From Table CXIV it will be seen that the number of persons who on remarriage described themselves as divorced shows an increase and is greater than the corresponding figure recorded for any earlier year. The regularity and continuity of the analysis generally confirms the incidence of remarriage tendencies in this class, but it should be borne in mind that the numbers may understate the facts owing to misdescription of status in the registers.

The reduction in the number of divorced men and women intermarrying, after a long series of almost continuous increases, is a noteworthy feature.

Table CXIV.—Annual Number of Persons Divorced, and of Divorced Persons who Remarried, 1876–1933.

Period.	Number of Persons Divorced.	Annual Number of Divorced Persons who remarried.							
		Total.	Men.	Women.	Divorced men marrying spinsters.	Divorced men marrying widows.	Divorced men and women intermarrying.	Divorced women marrying bachelors.	Divorced women marrying widowers.
Average									
1876–80 ..	554	104	56	48	42	12	4	31	15
1881–85 ..	671	128	68	60	53	12	6	42	15
1886–90 ..	707	169	80	89	65	11	8	65	20
1891–95 ..	744	214	110	104	89	15	12	75	23
1896–1900 ..	980	345	172	173	138	24	20	126	37
1901–05 ..	1,126	509	262	247	205	38	38	181	47
1906–10 ..	1,247	693	356	337	276	53	54	253	57
1911–15 ..	1,312	820	411	409	330	50	62	309	69
1916–20 ..	3,115	1,264	683	581	525	127	62	439	111
1921–25 ..	5,467	3,050	1,708	1,342	1,316	295	194	976	269
1926–30 ..	6,716	3,917	2,128	1,789	1,662	270	392	1,225	368
1921..	7,044	2,878	1,592	1,286	1,182	330	160	939	267
1922..	5,176	3,374	1,913	1,461	1,457	360	192	1,062	303
1923..	5,334	3,008	1,679	1,329	1,307	279	186	1,002	234
1924..	4,572	2,903	1,627	1,276	1,267	275	170	931	260
1925..	5,210	3,088	1,729	1,359	1,367	229	266	944	282
1926..	5,244	3,124	1,710	1,414	1,325	231	308	995	265
1927..	6,380	3,576	1,924	1,652	1,509	244	342	1,133	348
1928..	8,036	4,125	2,268	1,857	1,764	302	404	1,299	356
1929..	6,792	4,427	2,408	2,019	1,886	307	430	1,357	447
1930..	7,126	4,331	2,330	2,001	1,826	267	474	1,342	422
1931..	7,528	4,668	2,517	2,151	1,963	299	510	1,456	440
1932..	7,788	4,824	2,537	2,287	2,011	259	534	1,539	481
1933..	8,084	5,068	2,747	2,321	2,135	318	294	1,571	456

In Table P are given certain particulars concerning the marriages in respect of which suits for dissolution or annulment were commenced during the year. 3,723 petitions were filed at the Principal Registry in London and 1,072 at 38 District Registries. In respect of the petitions filed at the Principal Registry in London it will be seen that the most frequent duration of marriage at the date of the commencement of the proceedings is from 5–10 years with an average of 223 for each of those years of duration, but the maximum is not of particular significance, for this period only accounts for 30 per cent. of the cases, there being 17 per cent. of shorter duration, while in 53 per cent. the marriages have subsisted

for 10 years or more. Forty-one per cent. of the marriages in question were childless, and in a further 31 per cent. there was one child only. These figures are substantially similar to those recorded in 1931 and 1932.

Buildings in which Marriages may be Solemnized.—At the end of the year 1933 the numbers of churches or chapels of the Established Church and of the Church in Wales and of registered buildings in which marriages could be legally solemnized, were as follows :—

		Increase per cent. since 1921.
Established Church and Church in Wales	16,472	2·0
All other religious denominations ..	20,706	14·4
Total	37,178	8·5

The increase upon the numbers at the end of the previous year was :—Established Church and Church in Wales 27, other religious

Table CXV.

Denomination.	Buildings certified to the Registrar-General as meeting-places for Religious Worship.	Buildings registered for the Solemnization of Marriages.*	Increase or decrease (—) per cent. since 1921 in the number of buildings certified for Religious Worship.
Roman Catholics	1,929	1,788	23·7
Methodist Church‡	14,165	8,609	1·4
Congregationalists	3,499	3,226	4·0
Baptists	3,384	3,051	6·1
Calvinistic Methodists	1,384	1,097	6·5
Presbyterians	469	461	4·7
Unitarians	185	198	0·5
New Church	60	63	9·1
Catholic Apostolic Church	62	50	—11·4
Countess of Huntingdon's Connexion	45	40	— 4·3
Salvation Army	1,434	338	26·2
Society of Friends	421	†	— 2·3
Jews	307	†	18·5
Other Denominations	5,039	1,785	51·1
All Denominations ..	32,383	20,706	10·4

* Of these buildings nearly 1,000 were certified before 1852, as Places of Meeting for Religious Worship, to some other authority than the Registrar-General and therefore are not included in the preceding column.

† It is not necessary for buildings to be registered for the solemnization of Quaker or Jewish marriages. Under section 31 of the Births, Deaths, and Marriages Registration Act (1836), Registering Officers of the Society of Friends and Secretaries of Jewish Synagogues who have been certified to the Registrar-General record the marriages in each case.

‡ Includes Wesleyan Methodist, Primitive Methodist and United Methodist Churches.

denominations 220. The number of these buildings belonging to the various denominations is shown for the several geographical regions in Table N.

By the Acts 15 and 16 Vict. c. 36, and 18 and 19 Vict. c. 81, it was enacted that all places of religious worship not being churches or chapels of the Established Church, should, if the congregations desired, be certified as such to the Registrar-General, certification for public religious worship being a necessary preliminary to the registration of a building for the solemnization of marriages.

The number of places of meeting for religious worship on the official register on the 31st December, 1933, and the number of buildings registered for the solemnization of marriages are shown in Table CXV.

The Marriage Act, 1898, provided that under specified conditions marriages might be solemnized in registered buildings in the presence of duly authorised persons without the attendance of a Registrar of Marriages. The governing bodies of some of the registered buildings have availed themselves of this provision, and at the end of the year 1933, the number of such buildings which had been brought under the operation of the Act, and so remained, was 6,593 out of the total of 20,706. The numbers of these buildings, and the denominations to which they belonged, were as follows :—

4,333	Methodist Church.
948	Congregationalists.
683	Baptists.
160	Calvinistic Methodists.
469	Other Denominations and Unsectarian.
6,593	All Denominations.

LIVE BIRTHS.

The live births registered during 1933 numbered 580,413, corresponding to a birth-rate of 14·4 per 1,000 of the population living. (Tables B and C.)

The number of births is 33,559 less than those of 1932, a decrease of 5·47 per cent.

The current rate of 14·4 per 1,000 is the lowest so far attained in the records of this country. The recent fall in the rate had been showing signs of diminution in immediately preceding years, and it might have been inferred from the rates for 1929 and 1930 —16·3 in both—that the particular phase of movement associated with post-war adjustments was drawing to a close. The 1931 returns, however, showed a further decline to 15·8, and this was followed by 15·3 in 1932 and 14·4 in 1933. As explained on page 189, the present rate of recruitment is well below that which is necessary if a diminution of the total population is to be avoided in the future.

The birth-rate in this country attained its highest values since the commencement of civil registration during the period 1865-1880, when it exceeded 35 per 1,000 population, and from that time it diminished by gradual and practically continuous stages to 23·8 in 1914; the present rate of 14·4 per 1,000 is considerably less than half the maximum figure of 36·3 recorded in 1876.

The recent history of the birth-rate in this country may be compared with those of other countries of which particulars are at hand by reference to Table Q. The record extends over the period from 1911 to 1933 (for earlier years, *see* the Registrar-General's Annual Report for 1910) and covers therefore not only the years of the war period itself when the movements were quite abnormal, but a number of earlier and later years. Of the countries for which 1933 returns are available, only one—the Irish Free State—records increase in its birth-rate as compared with 1932, while the remaining 23 show decreases. Two only of these countries, Austria (14·3 per 1,000 population) and Sweden (13·7) have lower rates than that of England and Wales (14·4). In view of the experience recorded in this table, it is clear that tendencies cannot be discerned from the past year's movements that might herald any change of direction in the falling trends noted for most countries in the past decade.

In all the countries listed except France, Spain, Portugal, and Japan the recent rates show a large fall in comparison with pre-war experience, a fall which in respect of England and Wales is the more serious since the position of this country in relation to that of others was already a low one before the war. The case of France is somewhat exceptional in that the current rate is not much lower than it was before the war, so that instead of being outstandingly the lowest in the series as formerly, it now ranks above England and Wales, Austria, Germany, Norway and Sweden, and is equal to that of Belgium.

The crude birth-rate, or ratio of births to population of all ages, is a convenient form of statement when the object in view is to record the aggregate effect of all the various factors governing reproduction. It sums up the effects of all the influences governing the rate at which the community is reproducing itself and is, therefore, in conjunction with the corresponding form of mortality statement, the crude death-rate, the appropriate means of measuring natural increase. The number of births in the country, however, depends mainly upon the number of married women at the reproductive ages, and as they form less than one-eighth of the total population the variation of their numbers and ages over a period of time may be different from that of the whole population, in which case the crude birth-rates form but an imperfect measure of the changes in fertility, *i.e.*, of the rate of reproduction in proportion to the opportunity of reproduction. In the absence

of any knowledge of the constitution of the general population the crude rate is often used as an index of fertility, but always on the implied assumption of a fixed proportion of potential mothers, an assumption which may reasonably be made only in respect of short periods of adjacent years.

In order to exclude the effect of changing age-constitution of the population, and so obtain a better statement of variations of fertility, a method of standardization was introduced in the Statistical Review (Text) for 1922, and has been in use since then. A description of the method, together with a series of fertility rates calculated for England and Wales in 1921 and 1931 were given in the Registrar-General's Statistical Review for 1932 (Text, pp. 135, 136).

Summarized comparisons based on these fertility rates are given in the last column of Table CXVI for groups of three years about each census from 1871 to 1931, and for the individual years 1931 to 1933. The results are contrasted in that table with the more familiar comparisons given by the crude birth-rates whether calculated per 1,000 total population or per 1,000 married women between ages 15 and 45. Thus, in 1870–72, 2,148 legitimate births were recorded for every 1,000 that would have occurred under the standard fertility rates, the 1931 experience being in the aggregate less than half of that of 60 years before. From 1871 the rates diminished steadily and progressively to 1,592 in 1910–12. Since 1920–22 the even more rapid drop, commented upon in dealing with the crude rates, is shown by the further reductions in the index, from 1,460 to 1,000 in 1931. It will be observed that over the earlier years shown in the table the decrease in fertility was overstated by the crude rates, and that since 1920–22 the tendency has been in the other direction.

Illegitimate Births.—The live births registered during 1933 include 25,408 of illegitimate children, a decrease of 1,603 on the number in 1932, coincident with the decrease of 33,559 in total births. Illegitimate births have thus decreased by 5·9 per cent., and legitimate births by 5·4 per cent. As a result of these changes, the proportion of illegitimate to total births has fallen from 4·40 per cent. last year to 4·38 per cent., figures which compare with the minimum of 3·95 per cent. recorded for the period 1901–1905 and the maximum of 6·26 per cent. attained in 1918.

In addition to the crude rate comparison, an attempt has been made in Table CXVI to allow for the age distribution of the potential mothers in respect of illegitimate as well as legitimate births in the manner described above. In using the rates for illegitimate fertility, it must be remembered that they are of much less authority than the rates for legitimate fertility.

Seasonal Distribution of Births.—The number of births registered in each quarter of the year and their frequency per 1,000 population are shown in Table D. Since 1923 the highest rate has occurred in

every case in the second quarter. This contrasts with the experience of 1841 to 1890 when the highest rates usually occurred in the first quarter. The lowest rate is recorded consistently in the fourth quarter.

Table CXVI.—Birth-rates and Fertility, 1871–1933.

	Births per 1,000 Total Population.	Ratio to 1931.	Births per 1,000 Married Women, 15–45.	Ratio to 1931.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
Legitimate Live Births.					
1870–72	33·3	2,205	292·5	2,380	2 148
1880–82	32·3	2,139	286·0	2,327	2,117
1890–92	29·4	1,947	263·8	2,146	1,983
1900–02	27·5	1,821	235·5	1,916	1,797
1910–12	23·4	1,550	197·4	1,606	1,592
1920–22	21·7	1,437	178·9	1,456	1,460
1930–32	15·1	1,000	122·4	996	999
1931	15·1	1,000	122·7	1,000	1,000
1932	14·6	967	118·0	962	964
1933	13·8	914	110·4	900	905

	Births per 1,000 Total Population.	Ratio to 1931.	Births per 1,000 Unmarried Women, 15–45.	Ratio to 1931.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
Illegitimate Live Births.					
1870–72	1·96	2,800	17·0	2,982	2,886
1880–82	1·65	2,357	14·1	2,474	2,375
1890–92	1·31	1,871	10·5	1,842	1,755
1900–02	1·12	1,600	8·5	1,491	1,419
1910–12	1·03	1,471	7·9	1,386	1,363
1920–22	1·04	1,486	8·1	1,421	1,430
1930–32	0·71	1,014	5·8	1,018	1,002
1931	0·70	1,000	5·7	1,000	1,000
1932	0·67	957	5·6	982	974
1933	0·63	900	5·4	947	936

	Births per 1,000 Total Population.	Ratio to 1931.	Births per 1,000 total Women, 15–45.	Ratio to 1931.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
All Live Births.					
1870–72	35·3	2,234	153·7	2,387	2,179
1880–82	34·0	2,152	147·7	2,293	2,128
1890–92	30·7	1,943	129·7	2,014	1,972
1900–02	28·6	1,810	114·8	1,783	1,779
1910–12	24·5	1,551	98·3	1,526	1,581
1920–22	22·8	1,443	91·1	1,415	1,459
1930–32	15·8	1,000	64·3	998	1,000
1931	15·8	1,000	64·4	1,000	1,000
1932	15·3	968	62·6	972	964
1933	14·4	911	59·4	922	906

The seasonal distribution of births is thus consistent with the seasonal distribution of marriages, the frequency of which, as has already been noted (p. 165) is a maximum in the third and a minimum in the first quarter.

The degree of association between the frequency of marriages and that of births some nine to twelve months afterwards tends to increase with the progressive reduction in the size of families, and the consequent increase in the proportion of first-born children in the total.

Birth-rates of Different Parts of the Country.—The birth-rates, total and illegitimate, of individual administrative areas tabulated in Table E are summarized in Table CXVII for the geographical regions, and their sub-divisions.

The method for comparing the fertility of England and Wales in different years by the use of standard fertility rates applies equally well to the comparison of fertility in different sections of the population of which the sex, age and marital condition constitution is known, and the crude rate comparisons are supplemented in this table by the addition of a series of figures in which variations in birth-rates due solely to differences in the age and marital condition proportions of the several populations, as far as possible, have been eliminated.

Table CXVII shows for each of the specified divisions of the country the crude birth-rates of 1932 and 1933, the ratio of the crude rate to that of the country as a whole, and the corresponding ratio obtained by the use of the standard fertility rates of 1931.

The birth changes which have occurred between 1932 and 1933 in the geographical regions and types of area shown in the table are in general consonance with the movement in the country as a whole. Comparison of the 1933 crude rates for the several areas shows that the highest for all births are found in North I and II, and the lowest in the South-West and in Greater London. Crude rates for illegitimate births are highest in Wales II and North II, and lowest in Midland I.

The ratios shown in column (2) are based upon the crude rates and reflect therefore not only differences of fertility but also the varying incidence of sex, age and marital condition in the populations from which they arise. When the latter factors are eliminated as in column (4) of Table CXVII, the process may result in altering materially the relative position of an area; for instance, the ratio for Wales II rises from 993 (crude) to 1,210 (standardized) while Midland II falls from 1,007 to 954. If the areas be examined from the point of view of urbanization the change from the crude to the standardized comparison is also notable. By the crude rates the position of rural areas is distinctly understated, since from the point of view of fertility alone they are shown to be the most productive of all areas, and as compared with 1932 show an increase in relation to urban areas.

The extent of illegitimacy in different classes of area and parts of the country may be gathered from the right half of Table CXVII. Except for a wider range of variation generally the

Table CXVII.—Birth-rates by Geographical Regions, 1932 and 1933.

(For the constitution of the several regions, see page 6).

Region.	All Births.				Illegitimate Births.			
	Birth-rate per 1,000 Total Population.	Ratio to Rate for England and Wales, taken as 1,000 (Crude Rates).	Ratio of Actual Births per 1,000 of those which would have occurred had the Standard age rates been operating.	Ratio compared with that for England and Wales, taken as 1,000.	Birth-rate per 1,000 Total Population.	Ratio to Rate for England and Wales, taken as 1,000 (Crude Rates).	Ratio of Actual Births per 1,000 of those which would have occurred had the Standard age rates been operating.	Ratio compared with that for England and Wales, taken as 1,000.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1932								
England and Wales ..	**15·3**	**1,000**	**964**	**1,000**	**0·67**	**1,000**	**974**	**1,000**
Regional Summary—								
South-East	14·5	948	910	944	0·67	1,000	914	938
Greater London ..	14·6	954	890	923	0·65	970	830	852
Remainder of South-East.	14·3	935	945	980	0·69	1,030	1,074	1,103
North	15·9	1,039	998	1,035	0·70	1,045	1,018	1,045
North I	18·5	1,209	1,130	1,172	0·76	1,134	1,230	1,263
North II	17·0	1,111	1,119	1,161	0·96	1,433	1,487	1,527
North III	15·1	987	914	948	0·67	1,000	996	1,023
North IV	15·2	993	972	1,008	0·64	955	876	899
Midland	15·8	1,033	975	1,011	0·60	896	881	905
Midland I	16·0	1,046	1,002	1,039	0·58	866	836	858
Midland II	15·6	1,020	927	962	0·65	970	969	995
East	15·3	1,000	1,023	1,061	0·86	1,284	1,416	1,454
South-West	13·9	908	943	978	0·61	910	972	998
Wales	15·8	1,033	1,026	1,064	0·67	1,000	1,078	1,107
Wales I	16·2	1,059	991	1,028	0·59	881	987	1,013
Wales II	14·9	974	1,146	1,189	0·86	1,284	1,303	1,338
Density Summary of all Areas outside Greater London—								
County Boroughs ..	16·0	1,046	991	1,028	0·71	1,060	994	1,021
Other Urban Districts	15·0	980	945	980	0·61	910	927	952
Rural Districts ..	15·4	1,007	1,035	1,074	0·72	1,075	1,220	1,253
1933.								
England and Wales ..	**14·4**	**1,000**	**906**	**1,000**	**0·63**	**1,000**	**936**	**1,000**
Regional Summary—								
South-East	13·5	938	851	939	0·62	984	869	928
Greater London ..	13·5	938	822	907	0·60	952	789	843
Remainder of South-East.	13·7	951	900	993	0·64	1,016	1,020	1,090
North	15·0	1,042	941	1,039	0·65	1,032	963	1,029
North I	17·2	1,194	1,052	1,161	0·69	1,095	1,158	1,237
North II	16·0	1,111	1,049	1,158	0·89	1,413	1,420	1,517
North III	14·4	1,000	868	958	0·61	968	930	994
North IV	14·4	1,000	918	1,013	0·59	937	835	892
Midland	14·7	1,021	905	999	0·57	905	855	913
Midland I	14·8	1,028	928	1,024	0·56	889	833	890
Midland II	14·5	1,007	864	954	0·58	921	900	962
East	14·4	1,000	963	1,063	0·81	1,286	1,366	1,459
South-West	13·4	931	904	998	0·60	952	987	1,054
Wales	15·4	1,069	993	1,096	0·67	1,063	1,101	1,176
Wales I	15·7	1,090	963	1,063	0·58	921	977	1,044
Wales II	14·3	993	1,096	1,210	0·91	1,444	1,409	1,505
Density Summary of all Areas outside Greater London—								
County Boroughs ..	15·0	1,042	931	1,028	0·67	1,063	962	1,028
Other Urban Districts	14·1	979	891	983	0·57	905	891	952
Rural Districts ..	14·7	1,021	985	1,087	0·67	1,063	1,172	1,252

distribution is not significantly different from that of all births. The highest rates occur as a rule in the rural districts. It will be seen that whereas for all births the rural aggregate rate is 8·7 per cent. above the mean, for illegitimate only it is 25·2 per cent. above.

Sex Proportions at Birth.—Births of males in England and Wales in 1933 numbered 296,729 and those of females 283,684 ; the proportion of male to female births was 1,047, 1,021, and 1,046 to 1,000 for legitimate, illegitimate, and total births respectively. The corresponding proportions for total births in each year from 1893 onwards and in groups of years since the commencement of registration are shown in Table C (Part II). The extreme range during the last 50 years was from 1,032 per 1,000 in 1898 to 1,060 in 1919. During this period the highest ratio recorded prior to the war was 1,041 (in 1884, 1906 and 1909), which has also been the lowest point touched since 1919 (in 1926).

The extent to which different classes of area or portions of the country contribute to the preponderance of male births is shown in Table CXVIII. In 1931 the highest ratio, 1,073, occurred in the

Table CXVIII.—Male Births per 1,000 Female Births, 1931, 1932 and 1933.

	1931.	1932.	1933.
England and Wales	**1,049**	**1,050**	**1,046**
Regional Summary—			
South-East	1,047	1,046	1,044
Greater London	1,048	1,052	1,047
Remainder of South-East	1,046	1,036	1,039
North	1,045	1,050	1,048
North I	1,050	1,054	1,065
North II	1,072	1,036	1,055
North III	1,041	1,046	1,050
North IV	1,040	1,054	1,039
Midland	1,054	1,053	1,042
Midland I	1,052	1,048	1,040
Midland II	1,058	1,064	1,047
East	1,029	1,040	1,038
South-West	1,073	1,057	1,046
Wales	1,056	1,057	1,059
Wales I	1,060	1,054	1,044
Wales II	1,043	1,066	1,103
Density Summary of all Areas outside Greater London—			
County Boroughs	1,043	1,047	1,044
Other Urban Districts	1,057	1,050	1,052
Rural Districts	1,048	1,052	1,039

South-West, and the lowest, 1,029, in the East; in 1932, the highest' 1,066, in Wales II, and the lowest, 1,036, in the South-East (excluding Greater London) and in North II; while, in 1933, the highest, 1,103, was in Wales II and the lowest, 1,038, in the East. The inconsistency of some of these ratios is illustrated by Wales II which was the highest in 1932 and 1933 and one of the lowest in 1931 and by the South-West which fell from 1,073 in 1931 to 1,057 in 1932 and to 1,046 in 1933.

STILLBIRTHS.

Stillbirths registered in England and Wales as a whole are shown for each year in Part II of the Statistical Review, Table B, and for each quarter in Table D. The numbers occurring in metropolitan and county boroughs, and in the aggregates of urban and of rural districts in administrative counties are shown in Part I, Table 18, to which is prefixed a summary for the several larger regions into which the country is divided.

In England and Wales the stillbirths registered during 1933 numbered 25,084 in all, 13,576 being males and 11,508 females; the numbers representing 41, 44 and 39 per 1,000 total births or 43, 46 and 41 per 1,000 live births respectively. The total compares with the figure of 26,471 recorded last year.

Prior to 1st July, 1927, the date on which stillbirth registration became operative in this country under the Births and Deaths Registration Act, 1926, the only record of stillbirths in England and Wales was that obtained from notifications received by Medical Officers of Health. These were published in the successive reports, from 1919 onwards, of the Chief Medical Officer to the Ministry of Health and were summarised in the 1927 Statistical Review. (Text p. 128.)

The distribution of the total according to sex, legitimacy and geographical incidence in 1932 and 1933 is summarised in rate form in Table CXIX: in this Table columns have been included from which comparisons may be made between the incidence of stillbirths on the one hand and that of live births or of infant mortality on the other. Wherever the numbers are large enough to form a satisfactory basis of fact, the frequency of stillbirth amongst males is shown to be definitely greater than it is amongst females. The male excess for legitimate births is almost the same as that of last year, and it is maintained with considerable uniformity throughout the several sections distinguished. For illegitimate births, also, male excess is usually found, but exceptions are recorded in 1933 in North II, North IV, Midland II and in both sections of Wales. As between legitimate and illegitimate births, the latter exhibit the higher rates in all sections (the males of Wales II excepted), the amount of the excess being on a somewhat larger scale than that indicated in the comparison between the sexes.

Table CXIX.—Stillbirths, 1932 and 1933.

Area.	Stillbirths per 1,000 total births.					Stillbirths per 1,000 total births and Live Births per 1,000 population expressed in relation to corresponding rate for England and Wales taken as 1,000.				Stillbirths per 1,000 total births and Infant Mortality per 1,000 live births expressed in relation to corresponding rate for England and Wales taken as 1,000.		
	Total.	Legitimate.		Illegitimate.		Stillbirths.		Live Births.		Still-births.	Deaths under 4 weeks.	Deaths under 1 year.
		Males.	Females.	Males.	Females.	Legitimate.	Illegitimate	Legitimate.	Illegitimate			
1932.												
England and Wales ..	**41·3**	**44**	**38**	**56**	**49**	**1,000**	**1,000**	**1,000**	**1,000**	**1,000**	**1,000**	**1,000**
Regional Summary—												
South-East	33·2	35	30	48	43	799	867	945	1,000	804	829	856
Greater London ..	31·6	33	29	49	45	757	890	952	970	765	820	916
Remainder of South-East.	35·6	37	33	47	41	863	837	932	1,030	862	844	761
North	46·7	50	43	59	52	1,135	1,049	1,041	1,045	1,131	1,130	1,171
North I	44·1	47	40	60	53	1,069	1,070	1,212	1,134	1,068	1,184	1,225
North II	41·7	45	38	56	45	1,007	958	1,103	1,433	1,010	1,145	1,079
North III	47·1	50	43	59	51	1,145	1,045	986	1,000	1,140	1,124	1,133
North IV	48·8	52	45	59	54	1,189	1,072	1,000	955	1,182	1,105	1,190
Midland	40·7	43	37	59	50	983	1,032	1,041	896	985	1,045	1,010
Midland I ..	39·8	42	36	54	52	963	1,002	1,055	866	964	1,058	1,018
Midland II ..	42·5	44	39	70	46	1,027	1,087	1,021	970	1,029	1,018	995
East	39·6	42	36	44	55	956	930	993	1,284	959	915	821
South-West	41·1	43	37	71	56	980	1,212	911	910	995	924	790
Wales	55·6	58	52	74	56	1,353	1,244	1,041	1,000	1,346	1,149	1,064
Wales I	57·1	59	54	83	53	1,387	1,303	1,068	881	1,383	1,179	1,096
Wales II	51·2	54	47	59	60	1,243	1,133	959	1,284	1,240	1,060	969
Density Summary of all Areas outside Greater London—												
County Boroughs	43·5	46	40	60	51	1,054	1,055	1,041	1,060	1,053	1,074	1,147
Other Urban Districts.	45·4	48	42	60	49	1,103	1,040	986	910	1,099	1,045	964
Rural Districts ..	41·5	43	39	52	49	1,007	964	1,007	1,075	1,005	992	890
1933.												
England and Wales ..	**41·4**	**43**	**38**	**56**	**51**	**1,000**	**1,000**	**1,000**	**1,000**	**1,000**	**1,000**	**1,000**
Regional Summary—												
South-East	33·5	35	30	54	43	802	910	935	984	809	829	807
Greater London ..	33·0	35	29	54	43	790	910	935	952	797	815	851
Remainder of South-East.	34·2	35	32	54	43	819	910	942	1,016	826	850	741
North	46·3	48	43	59	57	1,120	1,082	1,043	1,032	1,118	1,123	1,191
North I	41·5	42	39	58	53	1,000	1,043	1,196	1,095	1,002	1,189	1,246
North II	45·5	49	41	55	58	1,098	1,054	1,094	1,413	1,099	1,055	1,105
North III	47·5	50	44	62	53	1,152	1,075	1,000	968	1,147	1,088	1,128
North IV	47·8	50	45	58	60	1,156	1,112	1,000	937	1,155	1,130	1,223
Midland	41·6	43	39	56	49	1,007	991	1,029	905	1,005	1,039	1,024
Midland I ..	41·4	43	39	61	44	1,002	979	1,036	889	1,000	1,056	1,032
Midland II ..	42·1	43	40	48	60	1,017	1,007	1,014	921	1,017	1,007	1,008
East	37·1	39	34	46	38	900	790	986	1,286	896	936	822
South-West	42·1	43	40	56	56	1,012	1,049	928	952	1,017	923	777
Wales	55·9	58	53	61	66	1,357	1,191	1,065	1,063	1,350	1,186	1,166
Wales I	55·4	57	53	65	68	1,345	1,245	1,101	921	1,338	1,220	1,223
Wales II	57·2	61	52	55	63	1,396	1,097	971	1,444	1,382	1,084	992
Density Summary of all Areas outside Greater London—												
County Boroughs..	43·8	46	40	54	53	1,059	1,006	1,043	1,063	1,058	1,074	1,175
Other Urban Districts.	44·3	45	42	54	52	1,073	998	986	905	1,070	1,039	978
Rural Districts ..	41·6	43	39	64	51	998	1,079	1,014	1,063	1,005	1,004	884

As regards areal comparison, Wales returns legitimate stillbirth frequencies markedly higher than those of any English sections, which among themselves decrease generally from the North, where the rate is about 12 per cent. in excess of the general average, to the South-East where it is 20 per cent. below. The contrasts are not so consistent among the illegitimate frequencies.

The relative positions in the various portions of the country and the close association in this respect between stillbirths and infantile deaths are brought out in the columns of the table in which the stillbirth rate and infantile mortality rate of the year are expressed in relation to that of the country at large, the latter being taken as 1,000 in each case. The similarity of incidence is marked in comparisons made with the mortality of the full first year of life, but the parallelism is found in certain areas to be even closer when the comparison is restricted to the deaths occurring within the four weeks immediately following birth.

Some idea of the local variation of stillbirths may be obtained from Table CXX, which shows the boroughs and the county urban and rural aggregates exhibiting the highest and lowest rates per 1,000 total births in 1933. Areas in which fewer than 20 stillbirths were registered have been omitted.

Table CXX.—Stillbirths, 1933. Range of local variation. Stillbirths per 1,000 total births.

Metropolitan Boroughs.		County Boroughs.		Urban Aggregates (Excluding County Boroughs)		Rural Aggregates.	
		Highest.					
Paddington	47	Merthyr Tydfil	70	Flintshire	61	Montgomery	81
St. Marylebone	38	Dewsbury	62	Denbigh	60	Merioneth	79
Deptford	36	Halifax	60	Gloucestershire	58	Caernarvon	66
Hackney	36	Bolton	59	Glamorgan	58	Carmarthen	62
Lambeth	36	St. Helens	59	Monmouth	58	Anglesey	61
Shoreditch	36			Cornwall	56	Denbigh	60
Wandsworth	36			Carmarthen	56		
		Lowest.					
Battersea	28	East Ham	31	Cambs.	31	Surrey	30
Woolwich	28	Southport	30	Hertfordshire	29	Sussex, East	30
Bethnal Green	25	Croydon	28	Bucks.	28	Bucks.	28
Poplar	25	Oxford	26	Ely, I. of	26	Oxford	25
Finsbury	23			Norfolk	26	Suffolk, West	25

As the registration of stillbirths has now been in operation for more than six years, a preliminary review of the figures may be attempted. A comparison of the more important ratios connected with live and still births in England and Wales, as a whole, is contained in Table CXXI, for the years 1928 to 1933. In common with live births, the proportion of stillbirths per 1,000 population has fallen (col. 2); the former from 16·7 to 14·4 and the latter from 0·70 to 0·62, decreases of 13·8 and 11·4 per cent., respectively. The proportion of stillbirths among total births (col. 3) seems to

show a tendency to rise; but it is not unlikely that some part of the observed increase may be due to gradual improvement in the record. The masculinity of stillbirths is consistently much higher than that of live births (cols. 4–7). A comparison of the masculinity of illegitimate and total stillbirths (cols. 6, 7), shows that the illegitimate excess of 1928 and 1929 has been changed into a deficiency in 1932 and 1933. The proportions of the illegitimate are throughout much higher among stillbirths than live births (cols. 8–11). Among illegitimate stillbirths, a male excess in 1928 (males 64·8, females 60·5) has changed into a female excess in 1933 (males 56·1, females 58·2).

Table CXXI.—Comparison of Live Births and Stillbirths, 1928–1933.

Year.	Stillbirths per 1,000—		Male births per 1,000 female births.				Illegitimate births per 1,000—			
			Live births.		Stillbirths.		Live births.		Stillbirths.	
	population of all ages.	total births (live and still).	Total.	Illeg.	Total.	Illeg.	M.	F.	M.	F.
Col. (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1928 ..	0·70	40·1	1,044	1,041	1,210	1,297	44·9	45·1	64·8	60·5
1929 ..	0·68	40·0	1,043	1,021	1,259	1,311	45·1	46·0	62·9	60·4
1930 ..	0·69	40·8	1,044	1,049	1,235	1,233	45·9	45·6	61·0	61·1
1931 ..	0·67	40·9	1,049	1,059	1,248	1,250	44·6	44·2	61·8	61·7
1932 ..	0·66	41·3	1,050	1,042	1,216	1,197	43·8	44·2	56·5	57·3
1933 ..	0·62	41·4	1,046	1,021	1,180	1,137	43·3	44·3	56·1	58·2

In Table CXXII, the stillbirth registrations in the years 1929–33 have been aggregated for a large number of areas, and related to the population data of the 1931 census. The range of variation from the average is considerable even when the basis of fact is adequate, and is naturally greater still when the numbers recorded are small, as in the case of illegitimate births in many of the areas distinguished.

NATURAL INCREASE.

In 1933 the excess of live births over deaths registered in England and Wales was 83,948, as compared with 129,843 in 1932, 140,451 in 1931, 193,384 in 1930, 111,181 in 1929, and 199,878 in 1928.

From the comparable series of rates per 1,000 living population given in Table R, it will be observed that, though there is rather greater irregularity in the successive rates of natural increase, they have, over the whole range of years there given, followed on the whole a similar course to those followed by both birth and death-rates, and have declined with advancing years. The present rate of natural increase is 2·1 per 1,000 population. A lower rate was recorded in 1918 (0·4) but, with this exception, it is lower than any so far recorded, the next lowest being 2·9 in 1929. It compares with

Table CXXII.—Stillbirths by Sex, Legitimacy and Area.—1929–1933.

Area.	Total.	Still-births registered.				Still-births per 1,000 total births (live and still).	Still-births per 1,000 females 15–45 1931 Census.	Male still-births per 1,000 female still-births.	Illegitimate still-births per 1,000 total still births.
		Legitimate.		Illegitimate.					
		Males.	Females.	Males.	Females.				
ENGLAND AND WALES ..	132,912	68,875	56,094	4,377	3,566	41	2·7	1,228	60
Regional Summary:									
South-East ..	34,175	17,672	14,215	1,306	982	33	2·0	1,249	67
Greater London ..	20,611	10,753	8,496	776	586	33	1·9	1,269	66
Remainder of South East.	13,564	6,919	5,719	530	396	34	2·2	1,218	68
North	50,757	26,241	21,566	1,616	1,334	45	3·1	1,216	58
North I ..	9,317	4,816	4,010	260	231	42	3·6	1,197	53
North II ..	4,873	2,512	1,976	208	177	42	3·3	1,263	79
North III ..	12,831	6,618	5,474	398	341	46	3·0	1,206	58
North IV ..	23,736	12,295	10,106	750	585	47	3·1	1,220	56
Midland	23,719	12,282	10,183	685	569	41	2·8	1,206	53
Midland I ..	15,668	8,093	6,770	435	370	40	2·8	1,194	51
Midland II ..	8,051	4,189	3,413	250	199	41	2·8	1,229	56
East	5,717	2,983	2,328	213	193	39	2·8	1,268	71
South-West ..	6,205	3,207	2,597	213	188	41	2·6	1,228	65
Wales	12,339	6,490	5,205	344	300	55	4·1	1,241	52
Wales I	9,458	4,965	4,061	229	203	56	4·3	1,218	46
Wales II	2,881	1,525	1,144	115	97	52	3·7	1,322	74
Density Summary of all Areas outside Greater London:									
County Boroughs ..	46,512	24,096	19,642	1,496	1,278	43	2·9	1,223	60
Other Urban Districts	39,696	20,630	16,948	1,176	942	44	2·9	1,219	53
Rural Districts ..	26,093	13,396	11,008	929	760	41	3·0	1,217	65
County Boroughs:									
Barnsley	392	207	165	11	9	53	4·6	1,253	51
Barrow-in-Furness ..	256	135	105	4	12	48	3·6	1,188	63
Bath	156	65	85	3	3	38	1·8	773	38
Birkenhead	606	311	264	16	15	43	3·4	1,172	51
Birmingham ..	3,340	1,719	1,452	79	90	39	2·6	1,166	51
Blackburn	450	233	179	18	20	55	2·8	1,261	84
Blackpool	304	156	121	14	13	55	2·3	1,269	89
Bolton	716	371	311	19	15	56	3·1	1,196	47
Bootle	381	213	151	4	13	43	4·0	1,323	45
Bournemouth ..	216	94	103	9	10	36	1·4	912	88
Bradford	995	515	402	29	49	46	2·6	1,206	78
Brighton	389	182	172	22	13	39	2·2	1,103	90
Bristol	1,262	684	519	30	29	40	2·5	1,303	47
Burnley	327	167	140	7	13	49	2·6	1,137	61
Burton-on-Trent ..	150	84	59	5	2	38	2·6	1,459	47
Bury	206	112	77	11	6	53	2·9	1,482	83
Canterbury	60	30	22	3	5	33	2·1	1,222	133
Carlisle	225	115	89	12	9	45	3·0	1,296	93
Chester	160	67	79	8	6	46	3·0	882	88
Coventry	477	250	204	12	11	37	2·2	1,219	48
Croydon	545	273	230	24	18	31	1·8	1,198	77
Darlington	291	148	132	5	6	49	3·3	1,109	38
Derby	411	219	173	11	8	36	2·3	1,271	46
Dewsbury	257	124	112	11	10	61	3·8	1,107	82
Doncaster	218	127	83	7	1	42	2·8	1,595	37
Dudley	258	129	119	7	3	43	3·5	1,115	39
Eastbourne	108	54	36	6	12	32	1·4	1,250	167
East Ham	369	201	160	4	4	34	2·0	1,250	22
Exeter	200	107	78	9	6	40	2·4	1,381	75
Gateshead	562	306	234	9	13	44	3·9	1,275	39
Gloucester	187	93	84	4	6	43	2·9	1,078	53
Great Yarmouth ..	168	87	74	5	2	39	2·4	1,211	42
Grimsby	348	191	137	6	14	40	3·2	1,305	57
Halifax	317	156	129	16	16	49	2·5	1,186	101
Hastings	139	68	50	10	11	36	1·8	1,279	151
Huddersfield ..	341	180	140	8	13	46	2·3	1,229	62
Ipswich	286	154	116	11	5	40	2·7	1,364	56
Kingston-upon-Hull	1,224	676	471	38	39	39	3·2	1,400	63
Leeds	1,735	867	746	64	58	46	2·7	1,158	70
Leicester	744	377	318	29	20	39	2·4	1,201	66
Lincoln	203	113	75	7	8	43	2·6	1,446	74
Liverpool	3,755	1,955	1,584	126	90	39	3·5	1,243	58
Manchester	3,038	1,586	1,239	126	87	47	3·0	1,291	70
Middlesbrough ..	678	332	306	24	16	44	4·3	1,106	59
Newcastle-on-Tyne	1,021	513	437	36	35	39	2·9	1,163	70

Table CXXII—*continued.*

Area.	Total.	Still-births registered.				Still-births per 1,000 total births (live and still).	Still-births per 1,000 females 15–45 1931 Census.	Male still-births per 1,000 female still-births.	Illegitimate still-births per 1,000 total still-births.
		Legitimate.		Illegitimate.					
		Males.	Females.	Males.	Females.				
County Boroughs:—*cont.*									
Northampton ..	206	103	91	5	7	33	1·8	1,102	58
Norwich	404	218	163	9	14	41	2·5	1,282	57
Nottingham ..	991	502	415	42	32	42	2·9	1,217	75
Oldham	549	279	221	33	16	56	3·0	1,316	89
Oxford	190	99	75	11	5	33	1·9	1,375	84
Plymouth	711	364	294	26	27	41	2·9	1,215	75
Portsmouth ..	858	431	337	59	31	39	2·9	1,332	105
Preston	522	264	229	20	9	53	3·4	1,193	56
Reading	282	133	130	11	8	38	2·4	1,043	67
Rochdale	297	148	128	13	8	48	2·5	1,184	71
Rotherham	279	142	120	8	9	42	3·4	1,163	61
St. Helens	543	286	236	14	7	48	4·4	1,235	39
Salford	946	466	437	24	19	49	3·3	1,075	45
Sheffield	1,778	943	756	45	34	45	2·8	1,251	44
Smethwick	257	142	110	5	—	35	2·4	1,336	19
Southampton ..	547	280	236	18	13	35	2·6	1,197	57
Southend-on-Sea ..	250	131	110	3	6	35	1·6	1,155	36
Southport	220	115	85	11	9	49	2·1	1,340	91
South Shields ..	472	262	191	10	9	40	3·5	1,360	40
Stockport	487	256	203	11	17	55	3·0	1,214	57
Stoke-on-Trent ..	1,370	714	583	45	28	52	3·9	1,242	53
Sunderland	820	421	362	22	15	39	3·7	1,175	45
Tynemouth	280	137	124	11	8	44	3·5	1,121	68
Wakefield	210	113	86	7	4	42	2·9	1,333	52
Wallasey	304	171	113	11	9	43	2·4	1,492	66
Walsall	378	191	176	6	5	37	3·0	1,088	29
Warrington	361	178	167	8	8	47	3·7	1,063	44
West Bromwich ..	315	167	140	7	1	38	3·2	1,234	25
West Ham	886	477	364	26	19	33	2·5	1,313	51
West Hartlepool ..	300	168	114	13	5	40	3·8	1,521	60
Wigan	445	236	187	15	7	55	4·1	1,294	49
Wolverhampton ..	454	245	187	8	14	38	2·8	1,259	48
Worcester	153	78	67	4	4	38	2·5	1,155	52
York	265	135	112	8	10	37	2·5	1,172	68
Cardiff	961	495	413	23	30	50	3·4	1,169	55
Merthyr Tydfil ..	412	213	172	17	10	69	5·2	1,264	66
Newport, Mon. ..	347	175	158	8	6	42	3·2	1,116	40
Swansea	791	423	342	14	12	54	3·9	1,234	33
Administrative Counties									
Bedfordshire ..	597	298	257	22	20	37	2·2	1,155	70
Berkshire	579	319	226	21	13	35	2·3	1,423	59
Buckinghamshire ..	637	345	254	19	19	31	2·0	1,333	60
Cambridgeshire ..	331	173	145	7	6	36	2·1	1,192	39
Cheshire	2,287	1,156	1,014	67	50	46	2·7	1,149	51
Cornwall	1,064	555	441	35	33	46	2·9	1,245	64
Cumberland ..	741	373	307	34	27	40	3·2	1,219	82
Derbyshire ..	2,423	1,273	1,015	67	68	45	3·3	1,237	56
Devonshire ..	1,231	630	503	49	49	40	2·3	1,230	80
Dorsetshire ..	745	371	328	24	22	40	2·7	1,129	62
Durham	4,147	2,131	1,810	111	95	43	4·0	1,177	50
Ely, Isle of ..	269	138	114	3	14	37	3·1	1,102	63
Essex	3,281	1,736	1,398	80	67	34	2·2	1,240	45
Gloucestershire ..	1,050	553	419	49	29	42	2·7	1,344	74
Herefordshire ..	336	162	143	22	9	38	2·7	1,211	92
Hertfordshire ..	900	465	384	19	32	30	1·8	1,163	57
Huntingdonshire ..	151	75	68	4	4	32	2·5	1,097	53
Kent	3,040	1,574	1,288	104	74	33	2·2	1,232	59
Lancashire ..	6,575	3,434	2,836	170	135	51	2·9	1,213	46
Leicestershire ..	961	516	404	18	23	38	2·6	1,251	43
Lincs, Holland ..	375	208	145	12	10	41	3·7	1,419	59
,, Kesteven ..	366	189	145	17	15	40	3·2	1,287	87
,, Lindsey ..	887	458	360	41	28	39	3·0	1,286	78
London	10,909	5,648	4,393	503	365	33	1·9	1,293	80
Middlesex ..	4,279	2,242	1,805	132	100	33	1·9	1,246	54
Norfolk	999	486	412	58	43	39	2·9	1,196	101
Northamptonshire ..	514	256	229	21	8	34	2·0	1,169	56
Northumberland ..	1,425	730	606	43	46	41	3·0	1,186	62
Nottinghamshire ..	1,671	879	714	50	28	43	3·1	1,252	47
Oxfordshire ..	293	144	123	13	13	30	2·1	1,154	89
Peterborough, Soke of	130	64	54	7	5	33	2·1	1,203	92
Rutlandshire ..	33	21	11	—	1	25	1·7	1,750	30

Table CXXII—*continued.*

Area.	Total.	Still-births registered.				Still-births per 1,000 total births (live and still).	Still-births per 1,000 females 15–45 1931 Census.	Male still-births per 1,000 female still-births.	Illegitimate still-births per 1,000 total still-births.
		Legitimate.		Illegitimate.					
		Males.	Females.	Males.	Females.				
Administrative Counties —*cont.*									
Shropshire	835	391	375	35	34	41	3·1	1,042	83
Somersetshire ..	1,226	666	488	41	31	42	2·6	1,362	59
Southampton ..	1,336	671	585	48	32	34	2·6	1,165	60
Staffordshire ..	2,834	1,488	1,232	58	56	43	3·4	1,200	40
Suffolk, East ..	627	338	250	20	19	38	2·8	1,331	62
,, West ..	269	134	113	13	9	36	2·4	1,205	82
Surrey	2,183	1,099	950	84	50	32	1·7	1,183	61
Sussex, East ..	602	319	246	20	17	34	1·8	1,289	61
,, West ..	498	267	185	25	21	32	1·9	1,418	92
Warwickshire ..	1,034	516	461	29	28	36	2·3	1,115	55
Westmorland ..	210	100	85	11	14	44	2·6	1,121	119
Wight, Isle of ..	202	92	96	10	4	37	2·0	1,020	69
Wiltshire	872	449	380	26	17	37	2·6	1,196	49
Worcestershire ..	978	487	440	30	21	39	2·6	1,121	52
Yorks, East Riding	534	280	206	25	23	39	2·8	1,332	90
,, North Riding	1,261	636	512	64	49	46	3·4	1,248	90
,, West Riding	6,044	3,109	2,623	184	128	47	3·3	1,197	52
Anglesey	225	120	88	8	9	57	4·2	1,320	76
Brecknockshire ..	264	140	106	10	8	56	4·1	1,316	68
Caernarvonshire ..	479	254	176	23	26	54	3·4	1,371	102
Cardiganshire ..	214	114	83	7	10	58	3·4	1,301	79
Carmarthenshire ..	886	490	348	25	23	62	4·2	1,388	54
Denbighshire ..	676	364	281	21	10	53	3·8	1,323	46
Flintshire	464	250	190	10	14	49	3·5	1,275	52
Glamorganshire ..	4,015	2,094	1,742	101	78	58	4·6	1,206	45
Merionethshire ..	200	85	97	10	8	60	4·2	905	90
Monmouthshire ..	1,782	935	780	31	36	55	4·7	1,184	38
Montgomeryshire ..	196	108	74	12	2	49	3·8	1,579	71
Pembrokeshire ..	339	187	122	17	13	47	3·5	1,511	88
Radnorshire ..	88	43	33	7	5	50	3·7	1,316	136

a figure of approximately 10 per 1,000 in the years immediately preceding the war and over 14 per 1,000 in the period 1876–1880 when the birth-rate was at about its maximum. Stated in these terms the curve of natural increase expresses no more than that the crude birth-rate has hitherto been greater than the crude death-rate, and that the decline in the former has advanced at a greater rate than the fall in the latter. From the general continuity of the series it may be inferred that the number of births will continue to exceed the deaths for some years, and that, apart from the results of migration, the population will continue to increase during such period though, naturally, at a slower pace.

What must not be inferred from mere excesses of births over deaths or from their alternative expressions as rates per 1,000 total population, is that the continuance of current conditions regarding fertility and mortality would be sufficient to ensure a continuous increase in the national population, both now and in the future. Attention has been drawn in previous Reports to the reduction in the population, which, apart from immigration, must inevitably take place in the near future if the current trend in the birth-rate persists. The data for 1933 indicates that the maximum population and the subsequent reduction are likely to come earlier than a few years ago was considered probable.

Table CXXIII shows for 1931–33 the rate of natural increase in various sections of the country, representing the combined effect of the several sectional birth and death-rates. Attention may be drawn to the large differences between the different sections of the regions, namely, North I (Durham and Northumberland), and North IV (Cheshire and Lancashire), and between Wales I (Brecknockshire, Carmarthenshire, Glamorganshire and Monmouthshire), and Wales II (the remainder of Wales). The figure for Wales II, 0·1 per 1,000, represents in the statistical sense an almost stationary population.

Table CXXIII.—Natural Increase per 1,000 living, 1931–1933.

	1931.	1932.	1933.
England and Wales	**3·5**	3·3	2·1
Regional Summary—			
South-East	**3·4**	3·0	2·0
Greater London	**3·9**	3·5	2·3
Remainder of South-East	**2·9**	2·3	1·7
North	**3·2**	3·4	1·9
North I	**6·1**	6·4	4·9
North II	**4·2**	4·5	3·0
North III	**2·7**	2·7	1·6
North IV	**2·3**	2·5	0·8
Midland	**4·6**	4·1	2·9
Midland I	**4·7**	4·2	3·0
Midland II	**4·6**	4·2	2·8
East	**3·4**	2·9	1·9
South-West	**1·0**	0·8	0·4
Wales	**3·4**	3·2	2·3
Wales I	**4·5**	4·2	3·0
Wales II	**0·7**	0·8	0·1
Density Summary of All Areas outside Greater London—			
County Boroughs	**3·4**	3·5	1·9
Other Urban Districts	**3·1**	2·9	1·7
Rural Districts	**3·7**	3·4	2·6

Table S, which provides an analysis of migration from 1911 onwards, shows that the balance of passenger movement, which for many years had been in the outward direction, has been reversed during the last four years. The net passenger movement into the United Kingdom was nearly 48,000 in 1933. This contrasts with about 77,000 in 1932 and 91,000 in 1931, and with an outward balance of 100,000 so recently as 1926.

GREAT BRITAIN AND IRELAND.

Population.—The first complete census of the United Kingdom was taken in 1821, when the population numbered 20,893,584 persons; during the 100 years 1821–1921 this number increased by about 126 per cent., the sum of the final census figures for

Table CXXIV.—Great Britain and Ireland. Vital Statistics. 1921–30, 1931, 1932 and 1933.

——	Great Britain and Ireland.	England and Wales.	Scotland.	Northern Ireland.	Irish Free State.
Estimated Population in the middle of the year 1933 (*in thousands*).					
Males	23,863	19,357	2,364	618	1,524
Females	25,663	20,993	2,548	653	1,469
Persons	49,526	40,350	4,912	1,271	2,993
Marriages.					
1933	374,028	318,191	34,215	7,630	13,992
Persons married per 1,000 living :—					
1921–1930	14·9	15·5	13·8	12·1	9·5
1931	14·9	15·6	13·5	11·8	8·9
1932	14·6	15·3	13·6	11·0	8·8
1933	15·1	15·8	13·9	12·0	9·3
Births.					
1933	748,924	580,413	86,546	24,601	57,364
Per 1,000 living :—					
1921–1930	18·8	18·3	21·5	22·1	20·2
1931	16·5	15·8	19·0	20·5	19·3
1932	15·9	15·3	18·6	19·9	18·9
1933	15·1	14·4	17·6	19·4	19·2
Deaths.					
1933	620,006	496,465	64,848	18,154	40,539
Per 1,000 living :—					
1921–1930	12·5	12·1	13·7	15·1	14·5
1931	12·6	12·3	13·3	14·4	14·5
1932	12·4	12·0	13·5	14·1	14·5
1933	12·5	12·3	13·2	14·3	13·5
Deaths of Infants under 1 *year.*					
1933	49,681	36,960	7,019	1,960	3,742
Per 1,000 live births :—					
1921–1930	74	72	89	81	70
1931	69	66	82	73	69
1932	69	65	86	83	72
1933	66	64	81	80	65

Great Britain and of the estimated population of Ireland in June, 1921, amounting to 47,123,196. Up to the date when the 1931 Census was taken there was a further increase of 4 per cent. The populations of the several portions of the United Kingdom for each census year from 1821 and for individual years from 1894 are set out in Table A.

Marriages.—The marriages during the year 1933 numbered 374,003, corresponding to a rate of 15·1 persons married per 1,000 of the total population. This rate was 0·5 per 1,000 above the corresponding rate in 1932 and 0·2 above the average rate in the ten years 1921–1930.

Births.—The live births registered in the year 1933 numbered 748,984, and were in the proportion of 15·1 per 1,000 of the total population. This rate was 0·8 below the corresponding rate in 1932 and 3·7 per 1,000 below the average in the ten years 1921–1930.

Deaths.—The deaths registered in the year 1933 numbered 620,117, and were in the proportion of 12·5 per 1,000 of the total population. This rate was 0·1 per 1,000 above the corresponding rate in 1932, and was the same as the average in the ten years 1921–1930.

Infant Mortality.—The deaths of infants under one year of age during the year 1933 numbered 49,657, representing a rate of 66 per 1,000 live births. This rate was 3 per 1,000 below that recorded in 1932 and 8 per 1,000 below the average in the ten years 1921–1930.

BIRTHS AND DEATHS AT SEA.

Marine Register Book.—In accordance with the Births and Deaths Registration Act of 1874 and the Merchant Shipping Act of 1894, Commanding Officers of ships trading to or from British ports are required to transmit returns of all births and deaths occurring on board their ships to the Registrar-General of Shipping and Seamen, who furnishes certified copies of such returns to the Registrars-General of Births and Deaths for England, Scotland, Northern Ireland and the Irish Free State. Similar returns are furnished to the Registrars-General of Births and Deaths by Officers in command of His Majesty's ships. The returns of births and deaths at sea received by the Registrar General constitute the "Marine Register Book." During the year 1933 this register was increased by the addition of 59 entries of birth and 912 entries of death.

REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES.

Progress of Registration.—The names in the alphabetical indexes of births, deaths and marriages recorded in the national registers of England and Wales were increased during the year 1933 by 1,713,260, this addition raising the total of names in the indexes, which at the end of 1933 embraced a period of $96\frac{1}{2}$ years, to 163,122,074 (Table T).

Searches and Certificates.—Besides the certified copies of the registered births, deaths and marriages kept in England and Wales pursuant to the Registration Acts, a large number of other registers and records are deposited in this Office under statute or other arrangement. A revised list of these various registers and records will be found on pages 149–155 of the Review for 1925. Searches may be made in any of these registers, and certificates obtained on payment of the prescribed fees.

Table CXXV affords an indication of the extent to which the copies of the records kept in this Office have been utilized by the public for legal evidence of births, deaths and marriages since 1866.

Table CXXV.

Years.	Total Searches.	Gratuitous Searches.	Searches paid for by Fees.	Certificates Issued.	Amount Received.		
					£	s.	d.
1866 (52 weeks) ..	12,135	—	12,135	10,017	1,860	15	6
1875 (52 weeks) ..	26,356	—	26,356	20,282	3,879	15	6
1885 (52 weeks) ..	36,450	—	36,450	27,682	5,317	13	6
1895 (52 weeks) ..	53,289	—	53,289	35,727	7,200	12	6
1905 (52 weeks) ..	65,142	—	65,142	50,310	9,611	9	0
1906 (52 weeks) ..	64,340	—	64,340	49,429	9,458	6	0
1907 (52 weeks) ..	69,249	—	69,249	53,058	10,194	9	0
1908 (53 weeks) ..	72,370	—	72,370	54,870	10,550	8	0
1909 (52 weeks) ..	132,169	58,626*	73,543	54,674	10,568	8	0
1910 (52 weeks) ..	126,716	51,347	75,369	57,019	10,939	5	6
1911 (52 weeks) ..	140,496	65,491	75,005	56,347	10,875	6	0
1912 (52 weeks) ..	149,752	69,151	80,601	61,143	11,752	6	0
1913 (52 weeks) ..	150,540	71,225†	79,315	60,356	11,613	19	0
1914 (53 weeks) ..	188,040	104,593	83,447	65,817	12,482	11	6
1915 (52 weeks) ..	202,939	118,788	84,151	69,746	13,007	10	0
1916 (52 weeks) ..	303,334	197,669	105,665	88,265	16,379	17	0
1917 (52 weeks) ..	272,199	177,403	94,796	80,374	14,859	14	0
1918 (52 weeks) ..	255,462	146,504	108,958	90,898	16,889	0	0
1919 (52 weeks) ..	301,913	170,670	131,243	107,067	20,017	14	6
1920 (53 weeks) ..	284,194	149,447	134,747	108,684	20,415	0	0
1921 (52 weeks) ..	258,461	131,167	127,294	99,911	18,949	10	6
1922 (52 weeks) ..	263,047	143,088	119,959	90,400	19,028	12	6
1923 (52 weeks) ..	269,822	144,118	125,704	93,701	20,875	16	0
1924 (52 weeks) ..	337,521	178,990	158,531	121,890	27,109	15	0
1925 (53 weeks) ..	488,781	339,790	148,991	115,378	25,610	2	6
1926 (52 weeks) ..	541,916	407,687	134,229	105,560	23,305	6	6
1927 (52 weeks) ..	1,002,345	854,084	148,261	115,009	25,733	16	0
1928 (52 weeks) ..	600,678	452,953	147,725	114,731	25,678	17	0
1929 (52 weeks) ..	550,742	402,853	147,889	116,768	25,903	18	0
1930 (52 weeks) ..	1,207,344	1,053,047	154,297	121,549	26,964	12	0
1931 (53 weeks) ..	651,414	509,267	142,147	109,163	24,323	1	6
1932 (52 weeks) ..	598,624	464,985	133,639	104,420	23,086	13	0
1933 (52 weeks) ..	591,668	455,664	136,004	108,050	23,790	11	0

* Including some searches made in 1908.

† In addition, there were 91,917 gratuitous searches made for National Insurance Audit purposes.

The 455,664 gratuitous searches during 1933 comprise 42,103 searches made for the purpose of verifying the ages of persons aged 70 and upwards claiming old age (non-contributory) pensions and 214,432 for persons claiming pensions under the Old Age Contributory Pensions Acts, 1925 and 1929; 123,349 for verification purposes in connexion with claims to widows' and orphans' pensions under the Widows', Orphans', etc., Acts, 1925 and 1929; 32,619 to assist dependents of men of H.M. Forces to produce evidence of marriage and of the births of children in connexion with claims to naval and military pensions, separation allowances, etc., and to verify the ages of certain classes of youths and men in connexion with service in the Army, Navy and Air Force; 26,752 for verification of age, etc., in connexion with National Health and Unemployment Insurance; and 16,409 for other public purposes.

Offences against the Registration Acts.—In 1933 fifteen persons, on prosecution by order of the Registrar-General, were convicted of offences in connexion with registration. The offences for which convictions were obtained were as under :—

(*a*) For failing to register a birth	4
(*b*) For failing to re-register a birth under the Legitimacy Act	None
(*c*) Giving false information when registering a birth, stillbirth or death	8
(*d*) Giving false information for the purpose of procuring marriage	3

In addition to the above cases proceedings were taken and convictions obtained by the Director of Public Prosecutions in cases reported through the Registrar-General, the offences including those of false registration and making false declarations when giving notice of marriage.

RE-REGISTRATION OF BIRTHS UNDER THE LEGITIMACY ACT, 1926.

Under the Legitimacy Act, 1926, an illegitimate child of parents who married after the birth of the child was, subject to certain conditions, legitimated; and the Act contained incidental provision to enable the births of such children to be re-registered. During the year 1933 authority was issued for the re-registration of the births of 2,968 children, being 176 less than the preceding year. It is still difficult to speak with any certainty as to the normal figure to be expected in future years, as a large number of applications are not made shortly after the marriage of the parents but are postponed until the children's birth certificates are required on entering or leaving school or attaining the age of 21.

The number of authorities issued during each quarter is as follows :—

Quarter.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
March	1,265	1,401	1,075	996	981	854	752
June	1,256	1,170	1,105	1,001	908	762	724
September ..	1,381	1,242	933	1,006	797	709	718
December ..	1,593	1,070	933	986	825	819	774
Totals ..	5,495	4,883	4,046	3,989	3,511	3,144	2,968

ADOPTION OF CHILDREN UNDER THE ADOPTION OF CHILDREN ACT, 1926.

The Adoption of Children Act, 1926, provided for the legal adoption of children by Order of the Court, and established a system of registration of such adoptions in an Adoption Register to be kept by the Registrar-General. The number of children whose adoption was registered during 1933 is 4,528. Table CXXVI furnishes an analysis of the Adoption Orders made by reference to the several classes of Courts and the quarterly distribution of the total figure.

PARLIAMENTARY AND LOCAL GOVERNMENT ELECTORS.

The returns of Parliamentary and Local Government Electors published in Tables U and V summarise the Register of Electors compiled under the Representation of the People (Equal Franchise) Act of 1928 in respect of the qualifying period of three months ending on the 1st June, 1933.

The particulars have been taken from statements furnished to the Registrar-General by the Registration Officers of the several

Table CXXVI.

Year.	Number of Adoption Orders dealt with.				Corresponding number of children, *i.e.*, Entries made in Adopted Children Register.				
	Total.	High Court.	County Court.	Court of Summary Jurisdiction.	Year's Total.	March Quarter.	June Quarter.	September Quarter.	December Quarter.
1927 ..	2,943	133	184	2,626	2,967	329	990	774	874
1928 ..	3,278	124	236	2,918	3,303	851	844	705	903
1929 ..	3,294	72	224	2,998	3,307	722	787	857	941
1930 ..	4,511	74	317	4,120	4,517	1,084	1,196	983	1,254
1931 ..	4,119	68	274	3,777	4,127	873	1,049	1,046	1,159
1932 ..	4,465	38	264	4,163	4,467	1,073	1,178	1,000	1,216
1933 ..	4,524	61	262	4,201	4,528	1,029	1,258	1,004	1,237

areas, or in the case of a University forming the whole or part of a University constituency, by the Chancellor, Registrar or other officer dealing with Parliamentary registration.

Registration Officers were instructed that the return of Parliamentary Electors should be the net total of individual Parliamentary Electors in each constituency, all duplicate entries being omitted from the count. In the case of Local Government Electors the number of names on the register was to be given. The instructions further directed that the names of "out voters" (that is, persons whose names appear twice in the Register, by reason of a claim under Rule 24 of the First Schedule to the 1918 Act) should be counted once only in respect of that qualification.

Table U refers to Parliamentary electors, and shows for each Parliamentary constituency in England and Wales, including the University constituencies, the numbers of males and females on the Register, and also the numbers registered in respect of business premises qualifications and the numbers on the absent voters list.

Table V refers to Local Government electors, and shows the numbers of each sex registered in respect of every local government area, *i.e.*, county borough, metropolitan borough, municipal borough, urban district and rural district in England and Wales.

The figures for the whole country are summarised in Table CXXVII and are shown in conjunction with the figures of previous Registers made since the passing of the 1918 Act.

Table CXXVII.—Parliamentary and Local Government Electors, 1918-1933.

Register.	Parliamentary Register (including University Constituencies).					Local Government Register.		
	Persons.	Males.	Females.	Business Premises Qualifications. — Males only up to 1928. Persons from 1929 (included in Cols. *b-d*).	Persons on Absent Voters' List (included in Cols. *b-d*).	Persons.	Males.	Females.
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*k*
1918 (Autumn)	17,222,983	10,281,054	6,941,929	159,013	3,362,028	13,930,130	6,998,665	6,931,465
1919 ,,	17,465,638	10,234,887	7,230,751	205,461	1,157,061	14,361,123	7,176,019	7,185,104
1920 ,,	17,584,552	10,176,750	7,407,802	203,471	254,866	14,712,453	7,364,912	7,347,541
1921 ,,	17,795,784	10,237,344	7,558,440	194,737	185,227	15,019,348	7,527,861	7,491,487
1922 ,,	18,001,692	10,312,248	7,689,444	199,904	162,901	15,322,625	7,700,108	7,622,517
1923 ,,	18,388,833	10,498,179	7,890,654	208,694	151,953	15,691,962	7,873,461	7,818,501
1924 ,,	18,806,842	10,719,922	8,086,920	211,257	165,564	16,015,033	8,007,384	8,007,649
1925 ,,	19,167,275	10,897,545	8,269,730	217,509	167,406	16,345,290	8,157,607	8,187,683
1926 ,,	19,346,954	10,982,128	8,364,826	206,199	161,460	16,574,549	8,284,181	8,290,368
1927 ,,	19,585,972	11,094,031	8,491,941	205,538	155,436	16,865,666	8,444,718	8,420,948
1928 ,,	19,866,649	11,226,396	8,640,253	205,793	154,432	17,179,487	8,608,017	8,571,470
1929 (Spring)	25,095,793	11,866,794	13,228,999	371,594	174,731	18,620,395	8,825,225	9,795,170
1930 (Autumn)	25,730,507	12,101,108	13,629,399	364,762	174,270	18,879,147	8,905,768	9,973,379
1931 ,,	26,135,944	12,288,852	13,847,092	365,090	174,274	19,156,018	9,036,870	10,119,148
1932 ,,	26,439,713	12,440,109	13,999,604	367,684	172,234	19,418,156	9,160,409	10,257,747
1933 ,,	26,715,526	12,578,340	14,137,186	365,734	168,684	19,659,678	9,274,801	10,384,877

It will be observed that the sex distribution of the electorate which, in respect of the Parliamentary Register, was formerly in the proportion of about 1·3 men to each woman, was completely altered by The Representation of the People (Equal Franchise) Act of 1928. That Act, which placed women on the same footing as men in regard to the franchise, added about 4½ million women to the Parliamentary electorate and nearly 1¼ million to the Local Government electorate, and as a consequence women now outnumber men by approximately 12 per cent. in the case of each. The somewhat abnormal increase in the male electorate between 1928 and 1929—an interval of six months, it should be noted, in place of the usual 12 months period—cannot be explained by the new Act which left the male franchise unaltered apart from a trifling addition—approximately 3,700—in respect of men registered in respect of their wives' occupation of business premises, and must be mainly ascribed to the special procedure, adopted for the first time in connexion with the 1929 register, of the universal service of a compulsory form of return which disclosed and made good omissions from the registers on the pre-1928 Act franchise.

Including a certain amount of plural representation in the case of those persons registered in more than one constituency by reason of their possessing the necessary residence or business qualification, or being entitled to be registered in respect of a University constituency, the total Parliamentary electorate of 26,715,526 represents 66·2 per cent. of the estimated total population, or 65·0 per cent. of the male and 67·3 per cent. of the female population; in the case of the rather more restricted Local Government franchise, the numbers are somewhat less and the proportions correspondingly lower, the total electorate being 48·7 per cent. of the whole population, or 47·9 per cent., and 49·5 per cent. in the case of males and females separately.

Of the total of the Parliamentary Registers, the bulk, viz. 26,617,720, represents the aggregate voting strength in the 509 geographical constituencies into which England and Wales is divided, the balance of 97,806 representing the five University constituencies. Eleven of the Boroughs, and three University constituencies, however, each return two members, so that the total representation in Parliament is by 528 members, 520 in respect of the geographical divisions, with an average electorate of 51,188 per member and eight in respect of the Universities, with an average electorate of 12,226.

MISCELLANEOUS.

Other tables appearing in Part II of the Statistical Review which have not formed the subject of special comment in the foregoing pages are :—

Table W, showing the Population, Births, Deaths, Infant Mortality and Marriages, with Rates in British Islands and Dominions, 1933.

Tables X and Y, showing the census populations respectively of the British Empire, Dominions, etc., and of Foreign Countries.

Appendix, showing changes in boundaries of various local government districts and the areas and populations involved.

WEATHER OF THE YEAR 1933.
ENGLAND AND WALES.

The year 1933 was distinguished by an exceptional deficiency of rainfall. Other important features were the marked excess of sunshine, the unusual warmth experienced from March to October, the great snowstorm in February and the abnormal sequence of thunderstorms in June.

The percentage of the normal rainfall over England and Wales as a whole was 83. The year was not as dry as 1921 with 70 per cent. or 1887 with 74 per cent. but, since 1870, the only other comparable years were 1893 with 83 per cent. and 1870 with 82 per cent. February, March and October alone gave an excess of rainfall, the excess being marked in February (160 per cent.). The deficiencies were outstanding in August, November and December and the long sequence of dry months, from April to September inclusive, was exceptional. The total rainfall for the year exceeded the average only to the east of the Pennines from Sunderland to Goole and locally in Hampshire.

With regard to temperature, the year under review was noteworthy. Mean temperature exceeded the normal in all districts, the excess varying from 1·0° F. in the Channel Islands to 2·0° F. in north-east England. An unusually cold spell occurred from January 20th to 29th, while mean temperature for February was, on the whole, rather above the normal. There followed a sequence of eight warm months. March was excessively mild: at Greenwich there is no other March with such persistent warmth by day in a record which goes back to 1841 and at Southport no warmer March has occurred in 62 years' records. The outstanding feature of the summer months was the unusual warmth of the period June to September as a whole. As far as can be ascertained the mean temperature of the four consecutive months exceeded that of any other similar period since before 1881. The very mild weather lasted until 25th October. It was not, however, until about 25th November that really cold weather set in and continued until the end of the year. The persistent and severe cold in December, particularly in southern districts, was perhaps as striking as the exceptionally warm summer. At several places in the southern half of England it was the coldest December since 1890, and at some individual stations the deviation from the normal mean temperature was more than −7° F.

Sunshine was excessive, particularly from January to March and June to September. Over the country generally the total sunshine during June to September probably exceeded that of any four consecutive months since the similar period in 1911.

Further information.—Tables relating to meteorological elements are given in Part I (Tables 30–32). A description of the weather of each month appears in the Quarterly Return of the Registrar-General and a summary of the observations at Greenwich for each month of the year appears in Table XI of the Return for the fourth quarter.

Charts showing the distribution of pressure, temperature, sunshine and rainfall for the year, together with summaries of the observations at numerous stations will be found in the Annual Summary of the Monthly Weather Report issued by the Meteorological Office.

A list of the publications of the Meteorological Office will be found in " List M " issued by H.M. Stationery Office.

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